

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 49 DECEMBER 7, 1987

► STRATEGIC ALLIANCE

IBM eyes PacTel Spectrum

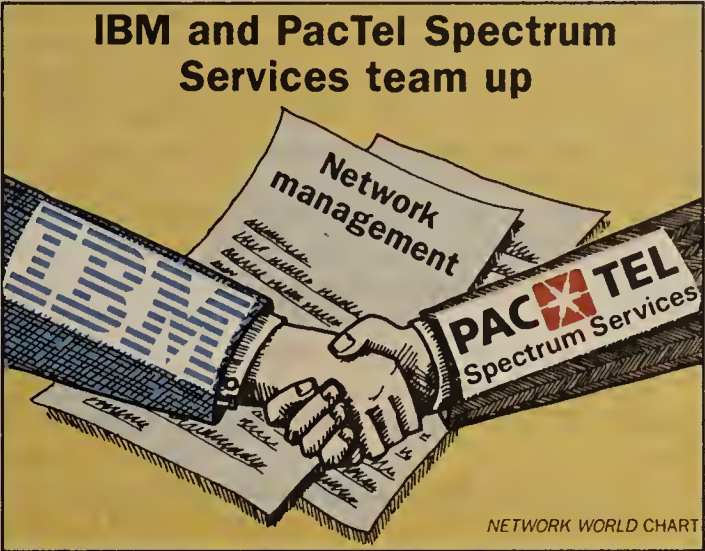
Big Blue to market firm's network management services.

BY PAUL KORZENIOWSKI
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — IBM plans to prop up its network management offerings through an alliance with net management service provider PacTel Spectrum Services, *Network World* has learned.

The alliance, which may be announced by the end of the month, will enable IBM to market PacTel Spectrum's network monitoring and management services to small and mid-sized companies, complementing the management tools IBM currently sells to larger corporations. IBM will also pump an unspecified amount of cash into the fledgling venture and help PacTel Spectrum engineers develop interfaces to NetView, IBM's host network management interface.

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► CONTRACT CONTROVERSY

AT&T/fed deal draws telco wrath

Local bypass plans rile C&P Telephone.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The C&P Telephone Co. of Washington, D.C. last week protested the awarding of an \$86 million private network contract to AT&T by the U.S. Department of the Treasury because AT&T plans to bypass C&P Telephone's local exchange network.

C&P Telephone, a subsidiary of Bell Atlantic Corp., filed a protest with the General Services Administration Board of Contract Appeals (BCA) after failing to win the Treasury Department's lucrative Digital Telecommunications Switching (DTS) system contract. The BCA has 10 days to respond to the protest.

The DTS contract calls for replacement of the Treasury Department's existing Centrex system with a 5ESS-based 26,000-line digital network connecting 16 Treasury locations in the Washington, D.C. metropolitan area.

Under terms of the contract, AT&T will engineer, furnish, install, operate and maintain the network. It will also provide hardware, software, switching and local transmission services.

When completed in 1989, DTS will be the largest private Integrated Services Digital Network in the world, AT&T claimed. The company will provide the Treasury Department with an undisclosed number of 5ESS switches to handle network switching.

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BUDGET SURVEY

Management resists strategic spending



BY PAUL KORZENIOWSKI
Senior Editor

Convincing upper management that the corporate communications network is a strategic asset and not a necessary evil is a tedious process for many communications managers. While a few enlightened corporations understand that increased communications spending may produce additional revenue, most companies still view communications as just another expense item.

This attitude is reflected in the fact that 1988 communications budgets will post only moderate increases — about 6% — over 1987 budgets. This budget growth is a tad healthier than the 5% growth experienced from 1986 to 1987.

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► TECHNOLOGY SUMMIT

IBM ISDN elite meet at forum

Steering global strategy.

BY BOB WALLACE
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — IBM last week brought together, for the first time, 100 of its premier ISDN planners from more than 10 nations for a forum designed to help keep the company's worldwide ISDN development efforts on course.

Speakers called together for the meeting, including the director of the Consultative Committee on International Telephony and Telegraphy, also addressed a press seminar focused on pricing of planned Integrated Services Digital Network services, IBM's ISDN testing program and the coexistence of ISDN and Systems Network Architecture.

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NETWORK LINE

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► MANAGEMENT

Tactics vary when it comes to hiring

BY MICHAEL FAHEY
Senior Writer

In staffing its communications department, First Wisconsin National Bank of Milwaukee follows a simple philosophy: Promote from within and provide an array of training and educational opportunities.

"Despite all of the technologically advanced equipment, it is still the staff that delivers the service," said Michael Spillane, manager of network control at First Wisconsin.

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► DEMONSTRATION

Firms run NETBIOS on TCP/IP

Standard interface put to the test.

BY MARY PETROSKY
West Coast Correspondent

ARLINGTON, Va. — Four vendors successfully demonstrated the compatibility of their Network Basic I/O System implementations last week, boosting the ability to run IBM NETBIOS-based local network operating systems and applications across TCP/IP-based personal computer nets.

Bridge Communications, Inc., Ungermann-Bass, Inc., Excelan, Inc. and Syntax Corp. participated in the demonstration, which was held in conjunction with the Second TCP/IP Interoperability Conference here.

Network General Corp. also joined in the demonstration, providing its protocol analyzer to test for interoperability. Communica-

tion Machinery Corp. was scheduled to participate in the demonstration but did not.

Standards for a NETBIOS interface to the Department of Defense's Transmission Control Protocol/Internet Protocol were proposed at an Interoperability Conference last March. At that conference, the interface was presented in the form of requests for comment, which amount to general industry acceptance. Before standards were available, each vendor had a different method for interfacing NETBIOS to TCP/IP.

As a result, network operating systems such as the IBM PC LAN Program and application programs such as Microrim, Inc.'s R:base 5000, which are written to NETBIOS, would not operate across different vendors' network hardware. This made it virtually impossible to create a multivendor TCP/IP-based net for personal computers.

TCP/IP allows NETBIOS to operate over both local- and wide-area networks. NETBIOS was designed to operate only in local networks.

The vendors participating in the demonstration have since developed software that embodies the standard TCP/IP-to-NETBIOS interface.

The demonstration consisted of

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► MULTIPLEXER MARKET

T-1 mux makers seek ISDN compatibility

BY PAUL KORZENIOWSKI
Senior Editor

Following the lead of Timeplex, Inc., manufacturers of T-1 multiplexers are beginning to explore the option of supporting ISDN interfaces in order to take advantage of the enhanced services carriers plan to offer starting in 1989.

Timeplex last month announced it would begin testing an interface in the first quarter of 1988 that would enable its Link family of multiplexers to support the CCITT's Primary Rate Interface for Integrated Services Digital Networks.

Competitors, such as AT&T, Digital Communications Associates, Inc. and others plan to follow suit with field tests in preparation for widespread ISDN deployment.

The ISDN Primary Rate Interface specifies how a 1.54M bit/sec T-1 link is segmented into 24 64K bit/sec channels. Of the 24 channels, 23 B channels support voice or data and the 24th channel, the D

channel, carries signaling information used to control the others.

Potential uses of the D channel represent the most significant difference between current and future T-1 multiplexer capabilities.

Adhering to ISDN standards would provide, among other things, a standard way to pass network management and performance information to other types of equipment, including private branch exchanges, X.25 packet switches and central office switches. Most multiplexer vendors currently use proprietary protocols for management and control.

ISDN compatibility will also enable T-1 multiplexers to interact with central office switches to control the configuration and destination of the channels within the T-1 pipe. Customers using a Primary Rate Interface to an ISDN network would be able, for example, to route the 23 B channels to different destinations, once within the central office switch. The channels

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► MODIFIED FINAL JUDGMENT

Greene slams door on RBHC R&D bid

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — U.S. District Court Judge Harold Greene last week dealt a harsh blow to the regional Bell holding companies and the U.S. Department of Justice, issuing an opinion that the Modified Final Judgment prohibition against RBHC manufacturing extends to research and development activities.

"There cannot be the slightest doubt that the parties of the decree intended to bar the [RBHCs] from the entire manufacturing process, including design, development and fabrication," Greene said in his opinion.

AT&T and a number of powerful industry groups had sought clarification from the court of the term "manufacture" as used in the Modified Final Judgment. That ruling prohibits the RBHCs from providing long-distance and information services and from manufacturing telecommunications equipment. The companies are also barred from owning subsidiaries involved

in telecommunications equipment manufacturing, although the RBHCs may market equipment produced by other vendors.

Observers said that, as a result of Greene's opinion, the RBHCs could be forced to divest themselves of subsidiaries involved in telecommunications R&D and to sharply curtail future acquisitions of telecommunications-related companies. Greene did not address that issue in his opinion.

For example, the ruling could force BellSouth Corp. to relinquish its holdings in Sirecor, Inc., a manufacturer of fiber-optic communications equipment. It could also require Pacific Telesis Group to cease its Project Victoria field trials because they involve the use of Pacific Telesis-designed multiplexing equipment.

RBHC officials were not happy with Greene's ruling. Thomas Bolger, chairman of Bell Atlantic Corp., said the ruling "unlawfully expands the scope of the manufacturing prohibition. We will have to appeal the court's decision because it impairs our ability to provide network services in an efficient

and cost-effective manner."

But Greene warned of the anti-competitive potential of the RBHCs. "The decree was aimed at preventing the anticompetitive practices in which the Bell system was assumed to have been engaged in the past," Greene said. "These practices in the design and development of equipment were as responsible for the manufacturing restriction as the practices in the fabrication of equipment."

"The evidence underlying the decree suggests that the Bell system used its local monopoly position to disadvantage and drive out of business competing manufacturers primarily through discrimination and cross-subsidization at the

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Illinois Bell is responding to concerns from a group of Chicago banks by working with them to develop options for disaster

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COMMUNICATIONS MANAGER

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NEW PRODUCTS AND SERVICES

Netlink boosts its SNA-Gate, allowing the IBM SNA gateway to support 64K bit/sec line speeds and enabling terminals to establish multiple sessions with an IBM host. **Page 27.**

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Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Editor Bruce Hoard toll free at (800) 343-6474.

TIMEPLEX/UNISYS:

RESHAPING THE FUTURE OF COMMUNICATIONS NETWORKING

On November 9, Timeplex and Unisys announced an agreement whereby Unisys plans to acquire Timeplex. As a result, some things will change. Many things **WILL NOT CHANGE**.

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- Designing integrated systems solutions for integrated network management and control **WILL NOT CHANGE**. Multi-vendor systems are a reality and connectivity is key.
- Supporting current and evolving standards through: open interfaces to TIME/VIEW, our integrated network management system; on-going support of IBM's NetView; participation in standards bodies, and the pursuit of standards such as OSI with other vendors **WILL NOT CHANGE**.
- Developing innovative technology that expands our customers' existing systems by providing a smooth migration path while protecting their present investment **WILL NOT CHANGE**.
- Our Timeplex name, our organization and the Timeplex team that has served our customers for over 18 years **WILL NOT CHANGE**.

WHAT WILL CHANGE, is that we now will enjoy the backing of Unisys, a \$10 billion information systems company. This will help us to enhance our market leadership position, and our ability to deliver business communications solutions.

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► LOCAL NETWORKING

Networker 1-2-3 lauded

Spreadsheet can be shared on PC LAN.

BY MARY PETROSKY

West Coast Correspondent

CAMBRIDGE, Mass. — Beta users of the long-awaited network version of Lotus Development Corp.'s 1-2-3 said last week they are happy finally to have a version of the popular spreadsheet package that provides data sharing and security.

Originally slated for delivery in early 1987, 1-2-3 Networker will begin shipping this week, Lotus announced recently. The Networker, a version of 1-2-3 Release 2 for use with personal computer local-area networks, supports up to five users at a time. A larger number of users can be accommodated by installing multiple Networker packages.

Although some 1-2-3 users question the need to share spreadsheets, beta users cited applications in which a networked version of 1-2-3 is required. Within the business development arm of Burbank, Calif.-based Lockheed Aeronautical Systems Co., administrative staffers need to share a single spreadsheet containing personnel salaries and other data, according to Robert Cathaway, senior defense requirements analyst.

Before the availability of the Networker, users were forced to work from one diskette, which they used in turn. Security consist-

ed of locking the diskette in a desk drawer. "Being in control of the data and the location of the data was a key issue," Cathaway said. Cathaway has had one copy of the Networker for more than 2 months, and during that time roughly a dozen people have had a chance to try it.

The Networker has made it much easier for the users to share spreadsheets and has provided better security through the program's access restriction features, which include the ability to protect individual files with passwords.

Similarly, at Healthcare International, Inc. in Austin, Texas, several managers regularly review the same reports, which are maintained in 1-2-3 spreadsheets. Before the availability of the Networker, only one manager could access the reports at a time. Now, several managers can review the reports simultaneously. The Networker locks worksheet files so only one user at a time can make changes, but it allows multiple users to have read-only access to the files.

The elimination of 1-2-3's copy-protection scheme is also a plus, according to the beta users. Although the stand-alone version of 1-2-3 could be installed on a network server and downloaded to network workstations, each user was previously required to insert a

key diskette before the program would run. "It was cumbersome — you had to switch out your network boot diskette and put in your key diskette," said Joe Krus, microsystems analyst at Healthcare International.

Krus also noted that the Networker loads from the server into a networked workstation much more quickly than the stand-alone version does. Because the stand-alone version booted so slowly from the server, most network users had continued to boot the program from their local hard disk drives, Krus said.

Some people have criticized Lotus, saying the Networker's \$2,475 price tag is too high. Neither Cathaway nor Krus was daunted by the pricing, however. "You can end up with a cost savings if you manage it correctly," Krus said. Because the Networker limits only the number of concurrent users, network administrators could have more than five users sharing the program. The licensing for the stand-alone version of 1-2-3 requires that every user have a copy.

For current 1-2-3 users, Lotus is offering one copy of 1-2-3 Networker in exchange for \$250 and five 1-2-3 Release 2.X system disks. Lotus has certified the Networker to run on the following local-area networks: the IBM PC LAN Program 1.1 with IBM PC Network or IBM Token-Ring network adapters; 3Com Corp.'s 3+ 1.1 with Etherlink network adapters; Novell, Inc.'s SFT NetWare 286 2.1 and Banyan Systems, Inc.'s Virtual Networking Software 2.1 with 3Com Etherlink adapters. □

► 15TH ANNUAL NATA SHOW

Voice/data gear key to growth

BY JIM BROWN

New Products Editor

DALLAS — Traditional vendors of voice communications systems need to branch out into integrated voice/data equipment sales to spur new growth in an otherwise flat market, said attendees at the North American Telecommunications Association's (NATA) 15th annual exposition and conference here last week.

Dubbed Unicom 1 Computer and Communications, the show reflected NATA's recent drive to educate its members on how to become systems integrators rather than simply sellers of private branch exchanges, key systems and telephones.

Digital Equipment Corp., a newly recruited NATA member, was among the 232 vendors here — a record for the show. Of the vendors in attendance, 30% were exhibiting data communications or data processing equipment to the nearly 6,300 interconnect companies and value-added resellers at the show.

Because its members are deeply rooted in voice technology, the organization has been developing plans to provide them with the

knowledge to piece together and sell such integrated voice/data applications.

Part of that effort has been a three-year recruitment drive to get major computer vendors to join NATA. DEC became the first computer vendor to join and expects to provide much of the schooling the interconnects need to sell data products.

Martin Rosenblith, industry segment manager of DEC's Telecommunications Industry Marketing Group, said DEC's primary thrust as a NATA member is to pitch its recently announced Computer Integrated Telephony (CIT) to interconnects. CIT comprises software running on a VAX minicomputer that works in conjunction with software running on a PBX to support integrated voice/data applications ("DEC lays plans to link VAXes, PBXs," NW, Oct. 26).

Switch vendors such as Northern Telecom, Inc. and Mitel Corp. are building PBX-based CIT applications that are expected to be available in late 1988.

DEC also sees its involvement in NATA as a way to introduce such products as DECconnect, DEC's wiring scheme for voice, data and video. "By joining NATA, we set

an objective to triple DEC's revenues from sales to the telecommunications industry, including sales to interconnects," Rosenblith said.

DEC also said at the show it will open an Applications Center for Technology (ACT) in Dallas that will focus on building applications utilizing telecommunications and computer hardware. When opened in early 1988, the Dallas site will become DEC's 19th ACT and will complement telecommunications application development at DEC's Atlanta ACT.

NATA members who take advantage of the organization's educational efforts may be able to learn to sell data equipment or recognize the need to form alliances with suppliers of data equipment and services, NATA officials and analysts said.

"With those alliances, computer dealers can play off our strengths in the voice world, and we can play off their strengths in the data world," said John Hinkle, recently elected chairman of NATA's board of directors and a vice-president and general manager for Houston, Texas-based Centel Communications Systems. "A lot of our mem-

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► INTEGRATION SOFTWARE

DEC eases PC-DECnet links

BY MARY PETROSKY
West Coast Correspondent

MAYNARD, Mass. — Digital Equipment Corp. cut the price of tying personal computers into DECnet more than 50% last week when it announced new software licensing policies and an entry-level personal computer integration package for the MicroVAX computer.

DEC cut the cost of integrating personal computers into DECnet by combining the license costs for key server and client software with other DECnet licenses, said Joanne Correia, personal computer interconnect marketing manager. DEC also announced starter kits that enable the MicroVAX II and MicroVAX 2000 to act as DECnet servers for personal computers. The kits are priced nearly 40% lower than the cost of the individual components.

In addition, DEC announced it will offer DECnet support and Ethernet adapters for the high-end models of the IBM Personal System/2 line, which are based on the Micro Channel bus structure. Currently, DEC is field-testing DECnet-DOS Release 2.0, which supports the IBM Personal System/2 Model 30 over Ethernet and Models 50, 60 and 80 over asynchronous lines, Correia said.

DEC's licensing policy has been in effect since September ("DEC embraces PC connectivity but shuts out Token-Ring," NW, Nov. 9) but has only recently been publicized. Under the policy, DECnet-VAX software licenses include the license for VAX/VMS Services for MS-DOS.

VAX/VMS Services for MS-DOS consists of networking and server software for the VAX, MicroVAX or VAXmate. It also allows the VAXmate and IBM Personal Computers, XT's or AT's to act as clients to the servers.

Licenses for VAX/VMS Services for MS-DOS had previously been priced from \$3,900 for the MicroVAX version to \$19,500 for the VAX 8800 version. By including this license with the DECnet-VAX license, DEC allows users to save 54% to 78% on the cost of turning VAXes into personal computer network servers.

VAX/VMS Services for MS-DOS is layered on top of DECnet-VAX. Users still must pay an average fee of

\$500 for the media and documentation for this software.

On the Personal Computer side, DECnet-DOS acts as the foundation for the client software, which includes Microsoft Corp.'s MS-Networks and MS-Win-

dows. DECnet-DOS lets IBM Personal Computers act as peers in a DECnet network. The software provides for a variety of network functions. It had previously been licensed for \$350 per Personal Computer.

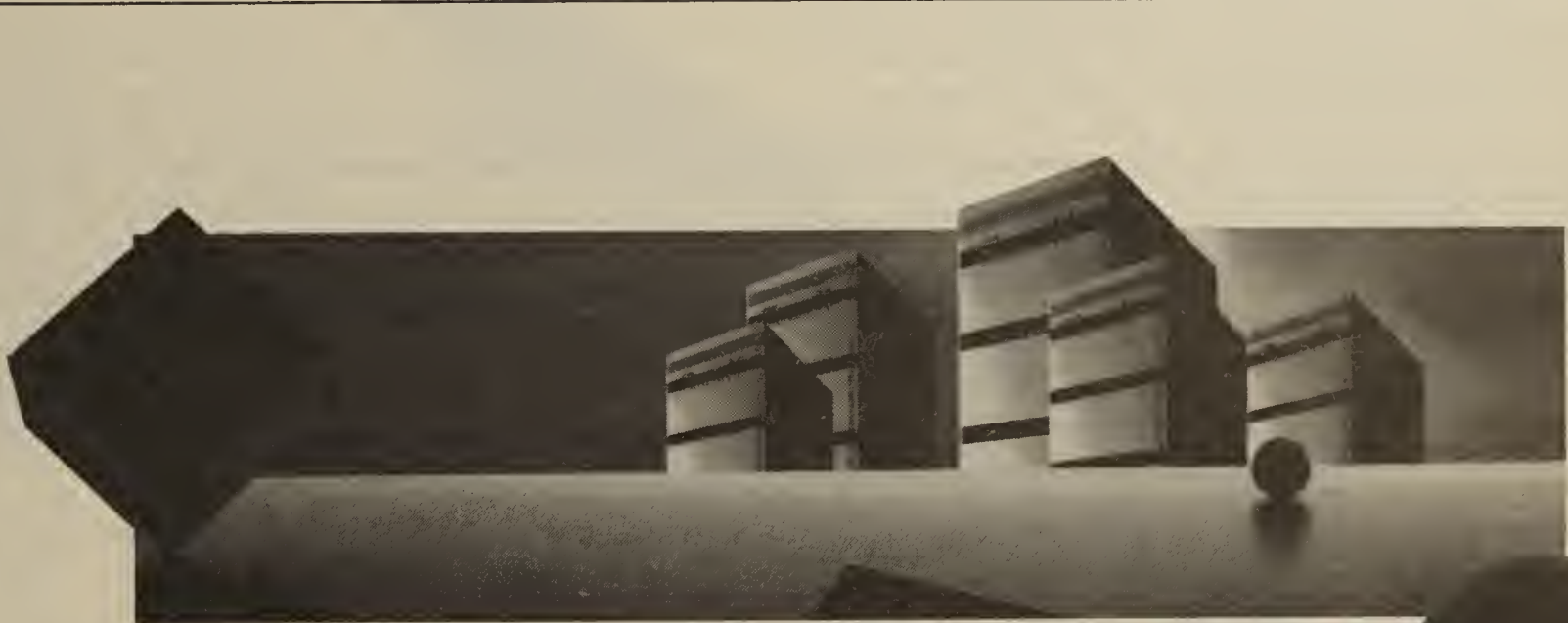
With the starter kits for

the MicroVAX II and 2000, DEC is unbundling its network software from its PC Ethernet adapter, thus allowing users to employ other vendors' Ethernet hardware.

Priced at \$3,000, the starter kits include a DECnet-VAX license, DECnet-DOS and client software for three personal computers, as well as a keyboard and mouse for the system ad-

ministration node. The MicroVAX 2000 version of the PC Integration Package includes one ThinWire Ethernet adapter to link the MicroVAX 2000 to the net.

DEC is offering the starter kits at the low end of its line first in order to gauge market reaction, Correia said. If the reaction is positive, DEC will consider offering starter kits across its entire VAX line. □



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AVANTI	3.0	3.3	3.3	3.7	3.7
COHESIVE	3.0	3.7	2.0	3.0	3.0
TIMEPLEX	3.2	3.4	3.0	2.9	3.2

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AT&T/fed deal draws wrath

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ing and routing functions. Beyond that, AT&T declined to elaborate on the DTS network, due to C&P Telephone's protest.

C&P Telephone said AT&T plans to use custom-designed 5ESS software to satisfy the ISDN requirements outlined in the Treasury Department's request for proposal. The company also said this is a violation of the RFP, which requested "off-the-shelf" software.

AT&T hired McLean, Va.-based Institutional Communications Co. (ICC) as a subcontractor to provide local transport services under the DTS contract. ICC sells fiber-optic transmission service to long-distance carriers and end users in the Washington, D.C. area. The company competes with the local Bell operating companies of C&P Telephone, C&P Telephone Co. of Virginia and C&P Telephone Co. of Maryland.

C&P Telephone alleged that the Treasury Department "did not consider all prospective bidders on an equal basis and failed to evaluate and award the contract in accordance with the requirements of the RFP," according to a company statement issued last week.

C&P Telephone currently provides the Centrex-based electronic switched voice network under a 1976 contract with the Treasury Department.

The department awarded the eight-year DTS contract on Nov. 20 after a three-month evaluation of bids submitted by AT&T and C&P Telephone. The RFP was issued in December 1985, although the department amended the procurement guidelines 21 times before final bids were accepted.

A Treasury Department spokesman declined to comment on C&P Telephone's protest.

C&P Telephone also charged that, "AT&T planned to offer local

telecommunications services in Washington, [D.C.] without filing the necessary tariffs with the District of Columbia Public Service Commission."

AT&T is not authorized by the local PSC to provide local telephone services, said Bell Atlantic spokesman Kenneth Pitt.

AT&T spokeswoman Edith Herman said, "We believe the Treasury made an appropriate award to AT&T and, beyond that, I really can't comment on C&P's protest."

DTS will be capable of interconnecting with the digital data service long-distance facilities currently used by the Treasury Department. It will also link de-

partmental local networks within the various branches of the Treasury Department.

Industry analyst Frank Dzuback, president of Communications Network Architects, Inc., based here, said, "C&P's protest seems like a case of sour grapes. I can't see that C&P has a valid claim."

"They're trying to prevent bypass and restrict competition," he said. "The local PSCs have seen fit to open the local exchange to competition and allow companies like ICC to provide bypass services. I'm sure the Treasury based its decision on who had the most innovative solution at the most competitive price." □

NETBIOS on TCP/IP

continued from page 2

four servers and three workstations on an Ethernet network. The servers were running a combination of MS-DOS and Unix operating systems. They were configured with hardware and TCP/IP software from the various vendors. The IBM PC LAN Program and a testing program from Innovative Software, Inc. called Smart LAN Performance Test were run across the servers and workstations to

test for NETBIOS compatibility.

The demonstration proved that popular network operating systems and applications written to NETBIOS can work in multivendor networks based on TCP/IP, said Bart Burstein, group product manager for Ungermann-Bass.

Excelan's manager of technical marketing, Steve Spanier, concurred. "This opens the gate for people to write applications to NETBIOS," he said.

Cooperation among the vendors has been key in providing users with the ability to create multiven-

dor networks, said Dan Lynch, president of Advanced Computing Environments, which sponsored the conference.

Ungermann-Bass has offered support of NETBIOS over TCP/IP since October 1986, when the company released its TCP-PC product, Burstein said. A version of TCP-PC that supports the standard NETBIOS-to-TCP/IP interface will be available in the first quarter of 1988, he said. Excelan expects to ship its TCP/IP software with the standard NETBIOS interface in January, Spanier said. □

IBM ISDN elite meet at forum

continued from page 1

Speaking at a dinner, Theodore Irmer, head of the CCITT, called for the members of the international communications industry to establish a pricing framework for ISDN. "The industry must tell the customer what ISDN will cost. This phase of evolution will decide the success or failure of ISDN," Irmer said. "The industry has to find out what the customer really needs and wants."

The economic viability of ISDN is critical, agreed Len Felton, quality and general development division director for IBM. "If the carriers tariff services too high, it will signal the demise of ISDN."

But the pricing issue is not easily overcome. Users say they cannot plan applications that use ISDN services until the services have been priced. And carriers say they cannot price ISDN services until they determine user interest.

"The fate of ISDN is in the hands of the customer," Irmer said. "With ISDN, customers become king because they decide what services they will use. They will migrate to ISDN only if they find it economically attractive."

Despite industry uncertainty on when ISDN services will be tariffed, John McElroy, systems manager of IBM ISDN Systems Management, predicted both local and long-distance carriers will begin offering ISDN services in 1988. "We expect AT&T will begin offering an [ISDN Primary Rate Interface] service next year," he said. All seven regional Bell holding companies will offer ISDN services in 1988, he said.

IBM used the meeting to release

selected details of an extensive survey it conducted to gauge user demand for ISDN services. Company officials said it asked more than 30 of its Enterprise Marketing Program (EMP) accounts — representing its largest voice and data customers — to identify benefits they will seek from ISDN.

One of the survey's primary findings was that customers said integrated voice/data services would need to be priced lower than current private-line-based offerings.

Toby Terrell, manager of systems and market planning for IBM's ISDN systems management group, said IBM met with the data processing and telecommunications managers for each EMP account as part of the user survey.

"Our customers wanted to know how ISDN will impact their current voice networks," he said. "These are very bottom line-conscious people."

Terrell said users cited the ability of ISDN to support equipment made by different vendors as a key promised benefit. The customers also said they are interested in new integrated voice/data applications that combine the power of voice switches and computer systems.

While much discussion was focused on how best to pitch still unavailable ISDN services to skeptical users, IBM detailed its worldwide ISDN conformance testing and field trial program.

IBM said it will use its ISDN Network Interface Characterization System, described as a Personal Computer-based network modeling

tool, to check for differences between CCITT-approved ISDN standards and implementations. Terrell said the information garnered from this work would be fed into the vendor's ISDN product development effort. Terrell said the ISDN testing system will be similar to the one IBM used to check conformance with CCITT X.21 and X.25 data network standards.

IBM said it will show how devices such as IBM workstations and controllers can be linked to the IBM 9751 CBX by building an ISDN demonstration at Rolm Corp.'s headquarters in Santa Clara, Calif. The system, scheduled to be operational in mid-1988, will use the ISDN Basic Rate Interface.

Terrell said an ISDN field trial, due to begin next year in West Germany, will enable users to download an SNA application from an IBM host to a Personal System/2 using a Basic Rate Interface. Personal System/2s hooked to an IBM 8751 CBX will be provided the same capability.

The IBM 8751 CBX is the European version of the IBM 9751 CBX. Basic Rate Interface is a CCITT specification that defines how customer premises gear is connected to an ISDN or to other customers' premises gear.

A second ISDN field trial, the first IBM ISDN Primary Rate Interface field test, is scheduled to begin next year in Norway. The effort will be expanded in 1989 to link a controller to an IBM 8751 CBX using Basic Rate Interface, Terrell said.

Frank Coor, a senior technical staffer for IBM, said ISDN will complement SNA. He said the lower levels of SNA can be adapted to support ISDN. □

Voice/data gear key to growth

continued from page 4

bers are already looking at ways to integrate data transmission into voice equipment," Hinkle said.

Adding a note of urgency, Tim Bajarin, executive vice-president at Santa Clara, Calif.-based consulting firm Creative Strategies Research International, warned that if interconnects watch from the sidelines too long, they stand to lose sales to computer dealers, some of whom have already started selling telephone equipment.

"The integration of the telephone and the computer will happen very soon. But the question is, will it be the computer dealers or the telecommunications dealers who go after that market first," Bajarin said. As more businesses give responsibility for telecommunications to the MIS department, MIS directors have begun to use telecommunications equipment better by implementing integrated voice and data functions, show attendees said.

One such potential integrated voice/data application would enable a computer linked to a PBX to search its data files for a telephone number and then instruct the PBX to dial that number. If the called party answers, the PBX would pass the call to an operator's telephone while the computer would send a data file about that person to the operator's terminal.

"If an interconnect company does not understand the data needs of its customers in the next three to four years, it may as well just hang it up," said Bill Fletcher, general manager of First Texas Connections, Inc. of Irving, Texas. □

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T-1 makers seek compatibility

continued from page 2

could also be reconfigured to accommodate changing voice/data needs.

ISDN compatibility for multiplexer makers will also make available more bandwidth within individual Primary Rate Interface channels, according to George Chow, president of Able Communication, Inc., a consulting firm in Milpitas, Calif.

Most T-1 multiplexers provide only 56K bit/sec of bandwidth per channel because 8K bit/sec is used to carry signaling and network management information. ISDN offers customers 23 64K bit/sec clear channel paths because all signaling information is carried on the D channel.

Multiplexer vendors have two options for linking their products to ISDN networks. In one scenario, they could design products that conform strictly to ISDN specifications. Such products would work with various services offered by local or long-distance carriers.

But certain T-1 multiplexers already offer many of the benefits that ISDN promises, such as the ability to reroute traffic automatically around a failed node. Many of these products were designed before ISDN specifications were fully agreed upon and would have to be dramatically redesigned for strict ISDN conformance.

The other option for vendors, according to Jeff Akers, AT&T's program manager for ISDN/T-1 multiplexing, is to develop an interface that wraps proprietary protocols within standard proto-

cols. This would enable a multiplexer to transmit information over an ISDN network but would prevent the device from taking advantage of ISDN network features such as channel reconfiguration from a central office switch. He said AT&T plans to develop this type of interface as well as one that conforms strictly to ISDN specifications.

Before any of this is possible, carriers will have to sort out a number of issues. Vendors have not yet completely agreed on what information should be shipped over the D channel and how the information should be packaged. Some carriers plan to use the channel to develop special applications for certain customers.

AT&T's Akers said conformance to the standard will not guarantee that all equipment will communicate in a uniform fashion. The standards offer vendors design flexibility, which can be used to differentiate products from competitors' wares. A connection between two AT&T products, for example, may be able to pass more information than a connection between an AT&T multiplexer and one from another vendor, according to Akers.

Another hurdle is the time frame for when carriers will offer Primary Rate Interface support. Most local exchange carriers have been concentrating on the Basic Rate Interface, which specifies how a single 144K bit/sec channel

is divided into two 64K bit/sec data or voice channels and a 16K bit/sec signaling channel.

Chow said local exchange carriers conducting ISDN field trials have been concentrating on the Basic Rate Interface. "Basic Rate Interface is strategic to the BOCs because it will help them sell enhanced services, such as Centrex," he said. Basic Rate Interface services could be available in a few months to some customers.

Analysts said AT&T is one of a few companies aggressively experimenting with the Primary Rate Interface. Vendors expect Primary Rate Interface services to become available in late 1988 or the beginning of 1989. Widespread implementation is expected in 1990. □

Greene slams door on R&D bid

continued from page 2

design and development stages," Greene said.

In addition to dealing a severe setback to the RBHCs, Greene sharply chided Justice Department officials for failing to investigate numerous allegations of RBHC manufacturing violations in the years since the Modified Final Judgment was signed.

"For more than two years, the Justice Department did not respond to requests, did not take enforcement action and did not inform the court that requests had been made," Greene said.

Along with AT&T, the North American Telecommunications Association, the Independent Data Communications Manufacturing Association and the U.S. Telecommunications Suppliers Association filed individual requests with the Justice Department in 1985 for enforcement of the Modified Final Judgment's manufacturing ban on the RBHCs. In June 1987, AT&T petitioned the court directly.

AT&T spokeswoman Edith Herman said, "Judge Greene's interpretation should benefit the telecommunications industry by resolving a long-standing controversy." □



When connecting different communications systems, it's best to put all your eggs in one basket.

CONSUMER NETWORKS

Sears/IBM venture to offer national videotex

BY MARY LINEHAN
Staff Writer

WHITE PLAINS, N.Y. — Nearly four years after its founding, Trintex last week announced it will begin offering next year a variety of videotex services to personal computer users in the home and office. Despite the failure of other videotex undertakings, Trintex, a joint venture of Sears, Roebuck & Co. and IBM Corp. formed in Feb-

ruary 1984, plans to offer videotex service on a nationwide basis for a flat monthly fee, rather than for a usage charge. Among the interactive information services expected to be offered are news, weather, sports and personal finance, as well as home shopping, banking, travel planning and electronic messaging. The company had not set a fee for the service at press time, but a spokesman estimated it would be

around \$10 to \$15 monthly. He said Trintex service will be available in selected cities in 1988 — San Francisco and Atlanta were cited as possible early sites — and nationwide by 1990. The spokesman said users of most personal computers with a 1,200 bit/sec modem and graphics card will be capable of receiving the service, dubbed Prodigy. Trintex will supply necessary software. Videotex industry watchers have waited a long time for news about Trintex, which employs 550 people, and some raised doubts about the company's fate. "With them forming a joint venture, employing as many people as they do and still not coming out with a

product for three years, I can't help thinking it is high time for them to move," said Jim Ivers, a senior analyst for consumer telecommunications at Link Resource Corp., a market research company based in New York. Many analysts have raised doubts about the future of the videotex market itself. Since the 1970s, videotex has been envisioned as an easy and inexpensive means for consumers to shop, bank and call up informational data bases from their homes. And, despite the resounding success of France's nationwide Minitel system, videotex pioneers in the U.S. have not fared well. In 1986 alone, consumer videotex offerings from Knight-Ridder Software Co., the Times-Mirror Videotex Services, Inc. and Centel Corp. folded.

"There has been a great deal of debate as to whether there is a market for videotex," Ivers said. "Certainly, it is not a mass market, and I don't see it becoming one any time before the 1990s. The model Trintex is presenting is frighteningly similar to some of those other services that have failed miserably. "It has the potential to fall flat on its face, unless Trintex has something unusual they haven't been talking about," Ivers said.

"There will be no meter running, so to speak," the Trintex spokesman said. "The cost of the service will be carried by the advertisers, not the users."

Trintex claims that one advantage of its service is the flat monthly fee it will charge users, compared with the usage fees typically levied for videotex services. "There will be no meter running, so to speak," the Trintex spokesman said. "The cost of the service will be carried by the advertisers, not the users."

Doug Fairweather, a spokesman for Sears, said the merchandising giant is interested in videotex as a new delivery system for products. "Sears is always looking for more and better ways to bring service and products to customers," he said. "Videotex offers its own set of new opportunities and avenues.

"This is a delivery system we feel has great promise, and the fact that other people have failed at it doesn't really deter us. We are always looking for ways to deliver that are in tune with people's lifestyles," Fairweather said.

Trintex said it has already made agreements with more than 30 information vendors, including *Consumer Reports* magazine, *USA Today* and Dow Jones & Co, Inc. The spokesman said more than 60 vendors, retailers and advertisers have signed on with the company.

Currently, CompuServe, Inc., the Columbus, Ohio-based subsidiary of H&R Block, Inc., is the largest single nationwide videotex system in operation. CompuServe claims to have nearly 300,000 users. □

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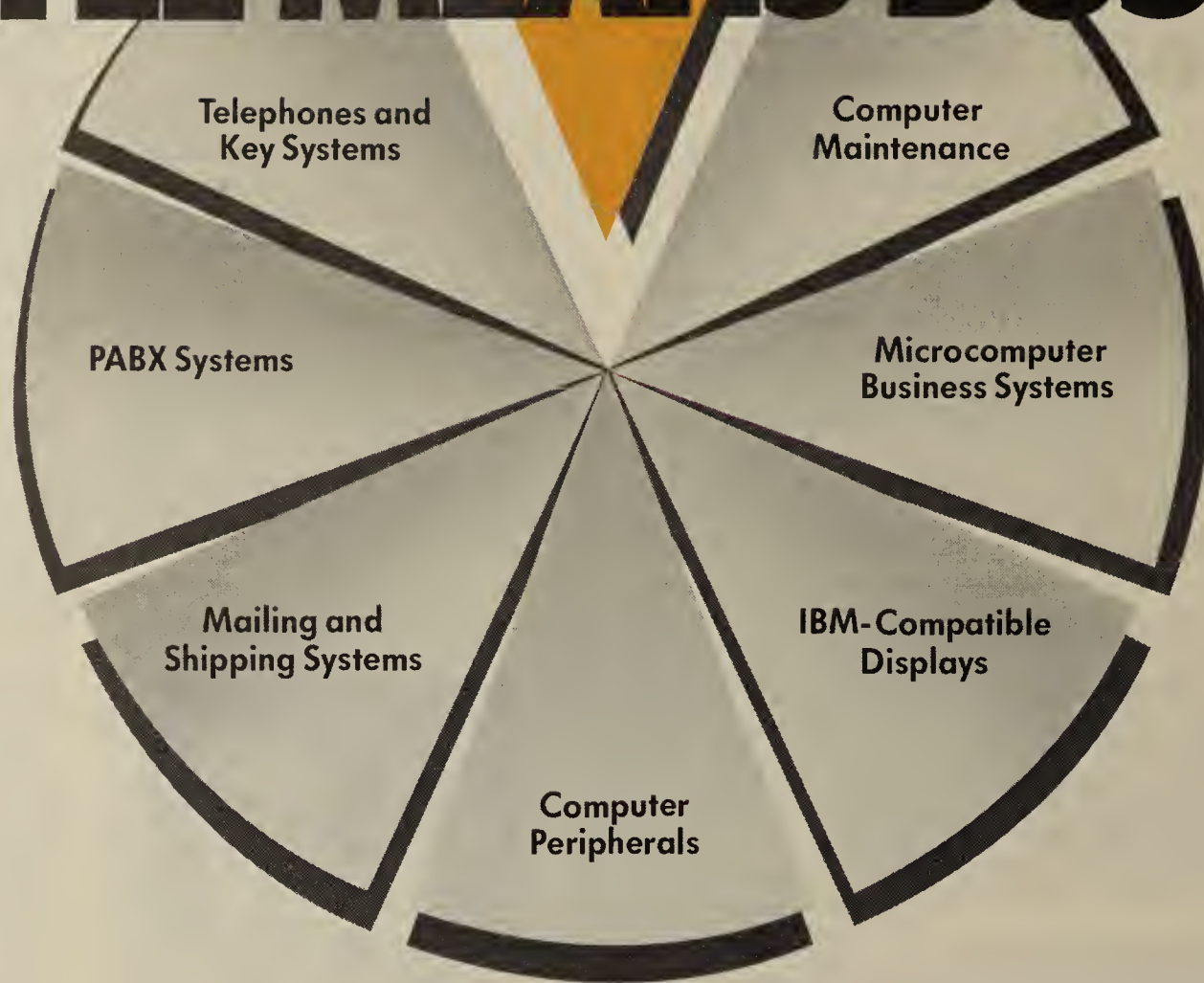
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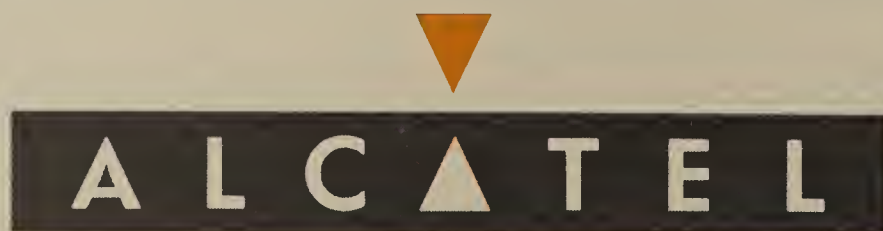
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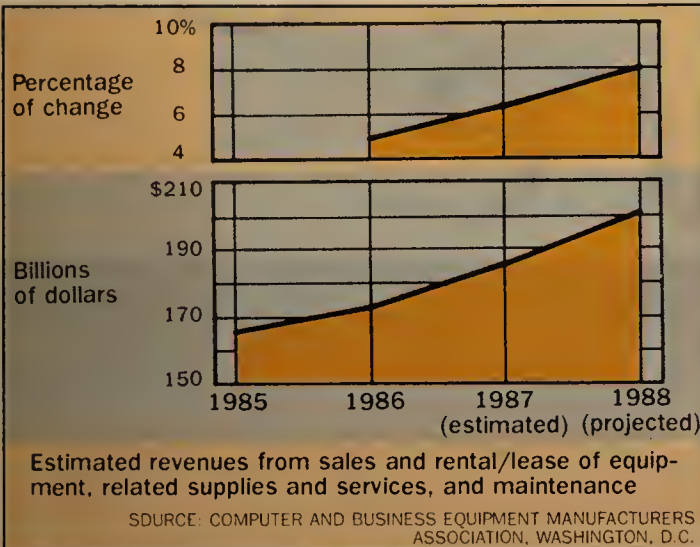
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INDUSTRY UPDATE

Micro application software sales soar

According to a recently released report from Market Intelligence Research Co. of Mountain View, Calif., microcomputer application software sales increased from slightly more than \$1 billion in 1983 to more than \$3 billion during 1986. The report, entitled "Microcomputer Business Application Software Markets," says 1993 sales will reach \$7.6 billion.

Worldwide telecommunications industry revenue growth



DATA COMMUNICATIONS

Switched 56 services threaten private lines

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The regional Bell holding companies recently began offering digital switched 56K bit/sec services within local access and transport areas, in hopes of providing users with a less expensive alternative to dedicated private-line services.

The digital switched 56K bit/sec services are designed for businesses with multipoint, low-traffic, bulk data transmission requirements in the local telephone exchange. Customers with intermittent traffic requirements will be more likely to use switched 56K bit/sec services than high-volume users, which will continue to find private lines more cost-effective.

In addition to offering local digital switched services, the RBHCs are providing long-distance carriers with switched digital access to their local exchange networks for the first time. The advent of digital switched access will provide users of long-distance services, such as AT&T's Accunet Switched 56 service, with a less expen-

sive, switched connection to the local telephone network.

Accunet Switched 56 is the long-distance version of the RBHCs' local switched 56K bit/sec services.

Prior to digital switched access, Accunet customers had to use private-line access to terminate their switched 56K bit/sec calls over the local exchange. This increased the cost of Accunet and made it a less attractive alternative to private-line service.

Six of the seven RBHCs offer switched 56K bit/sec services in their operating regions. Ameritech offers the service in Ohio and Illinois; BellSouth Corp. in Louisiana, Mississippi, Alabama and Tennessee; Nynex Corp. in New York and Massachusetts; Pacific Telesis Group in California; Southwestern Bell Corp. in Kansas; and US West, Inc. in Minnesota and Nebraska.

All six companies plan to make digital switched services available in all of their operating regions eventually, although access to

See page 53

RESTRUCTURE

Alltel acquires Contel division

Telephone gear supplier gets part of Texocom.

BY PAM POWERS
Senior Editor

ATLANTA — As part of restructuring now in process, Contel Corp., based here, recently sold a portion of its Texocom telephone supply business to Alltel Supply, Inc. for an unspecified amount.

The part of Texocom sold to Alltel Supply resells telephone gear such as phone sets, key systems, cable and components to end users. Alltel Supply is a subsidiary of Alltel Corp., a competitor of Texocom.

The part of Texocom responsible for distributing phone gear to Contel's numerous telephone companies nationwide remains with Contel. The portion sold generated about \$89 million in revenue last year, a Contel spokesman said, but he would not comment on the division's profitability.

Alltel Supply, also based in Atlanta, distributes phone equipment made by more than 300 manufacturers to end users, independent phone companies, the government and interconnects, according to William Moore, Alltel Supply's president.

Alltel Supply, which is also involved in the cellular mobile telephone and long-distance resale markets, posted revenue of \$115 million last year.

Moore said, "We are very pleased with the acquisition. Texocom has more than 3,000 customers, some of which we share. This allows us to expand our current customer base considerably."

In addition to gaining Texocom customers, Alltel Supply will assume some of its inventories and other unnamed assets. The Contel spokesman said the two companies are now negotiating the fate of the sold unit's end-user sales and support staff.

Both companies said they expect the merger to be completed late this month, pending regulatory approval. □

INDUSTRY EYE PAM POWERS

BOCs: Will the rich get richer?

If U.S. District Court Judge Harold Greene has been stingy handing out freedom to the Bell operating companies this year, some other powerful influences have been busy rallying around the Bells, bearing magnificent regulatory gifts to generate lots of revenue for them. But it's still a matter of controversy whether the BOCs need or deserve help to make more money, something they seem adept at doing on their own.

Two weeks ago, the Federal Communications Commission proposed the imposition of access charges on private network users that switch calls through the local exchange. Private network users think imposition is the proper word for the proposal.

This was the case with the FCC's proposed access charges for enhanced service providers. The idea behind the charges is to compensate the BOCs for use of their nets.

On top of that, the National Telecommunications and Information Association (NTIA), a division of the U.S. Department of Commerce, in the same week asked the FCC to challenge Greene's decision to limit the BOCs from information services. NTIA maintained that Americans are being denied home-shopping and home-banking services such as those that have been available for years from France's Minitel and similar projects in other countries.

It's commonly accepted that service providers should be compensated for use of their facilities, regardless of who the user is.

But someone must be responsible in the wake of any industry deregulation to ensure that no one company gains an unfair advantage over its competitors. The BOCs still control much more than 90% of the local exchange business. With that sort of stranglehold over the market, should the bonds that tether them be loosened?

The BOCs' ability to excel in new areas of business has grown dramatically in the past year, making the prospects of deregulation even scarier. They seemed much wiser in 1987, perhaps as a result of increased pressure on earnings from lower rates of return, depreciation expenses and, for some, continued losses in unregulated businesses. Rather than crippling them, however, tough times made most BOCs take a hard look at operating expenses and organizational makeup.

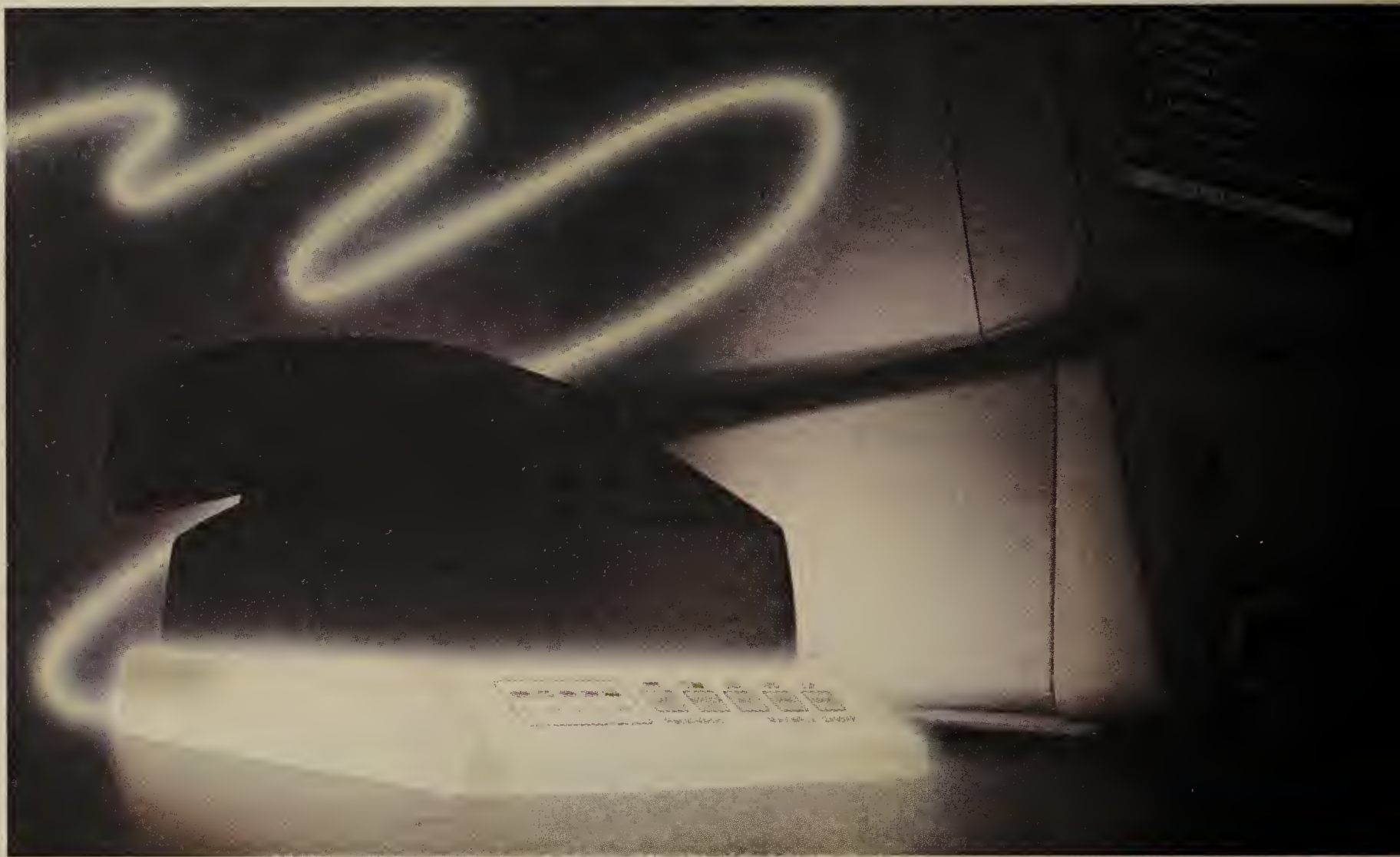
What resulted was a number of restructurings — typically involving layoffs — and the development of stronger and more realistic strategies for penetrating unregulated arenas. That means that, in 1988, the BOCs as a whole will be operating with less fat and more in-house marketing expertise. More of their unregulated operations are likely to turn a profit next year.

So then what happens if you let them loose on enhanced service providers and insist that users of private networks pay them fees that will boost their revenues by hundreds of millions of dollars? A lot of competitors hope they never find out. □

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TELECOM TRENDS

“If the proposed digital [Enhanced Private Switched Communications Service] network could give me a service availability comparable to [AT&T's Dataphone Digital Service] but at a lower cost, I would be very interested in sending data over the network.

John McGrath
Telecommunications assistant vice-president
Consolidated Rail Corp.
A longtime EPSCS user

CONTINGENCY PLANNING

Banks plan for net woes

Conclave devising strategies for network disaster recovery.

BY BOB WALLACE
Senior Editor

CHICAGO — A small group of banks will meet here next week to discuss contingency planning and devise strategies to minimize the impact of equipment and transmission facility failures on their companies' voice networks.

The group, which includes Continental Bank International, First National Bank of Chicago, Northern Trust Co. and Harris Trust & Savings Bank, meets at least once a month to discuss contingency planning and other issues of common interest, including technical evaluations of products and services,

building wiring projects and staffing issues.

Illinois Bell, the users' Bell operating company, responded to concerns voiced by the several-year-old group and other users by creating the position of contingency planning director in April. Dave Anderson has been selected for that post.

In the months since his appointment, Anderson and Illinois Bell users have explored options as diverse as dynamic call routing, which enables the BOC to direct calls around damaged or inoperable BOC facilities, as well as the construction of a backup trading floor, which could be used by

banks and other financial institutions in the event of a disaster at existing trading facilities.

Jack Frey, a vice-president with Continental Bank, lauded Illinois Bell's willingness to help its users draft individual contingency plans. "Dave Anderson has been working with us behind the scenes to put together a contingency plan," Frey said. "Their help has been a big boost for us."

With the BOC's assistance, the bank has created a disaster contingency plan designed to minimize the damage caused if one of its serving central offices goes down.

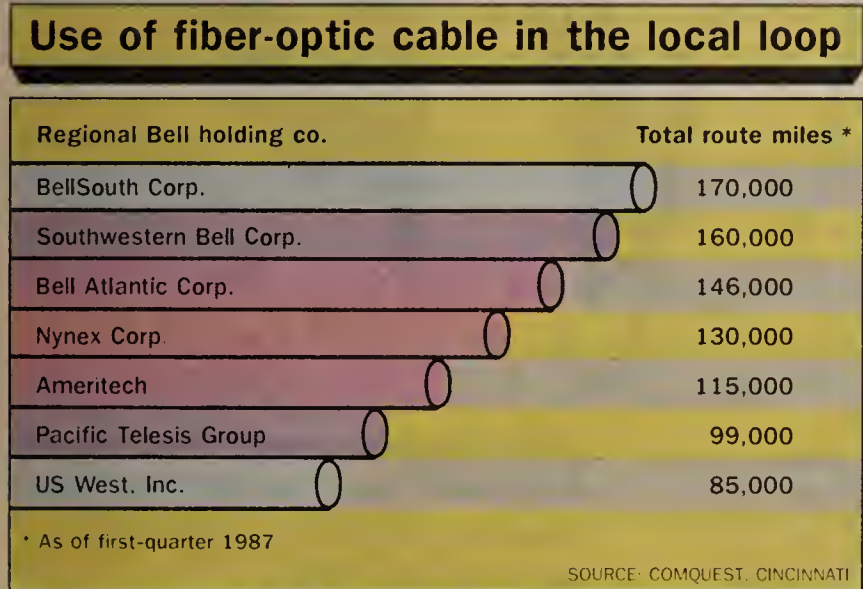
Continental Bank now uses services provided by two BOC central

offices. One of the central offices provides the bank's headquarters with 8,850 lines of analog Centrex service. A second provides more than 4,500 bank employees with electronic messaging services only.

"If the [AT&T] 1AESS switch that provides us with Centrex service goes down, Illinois Bell will intercept incoming calls at its Canal central office switch and reroute them to the 1AESS at our [E-mail] central office," Frey explained. The E-mail central office also supports voice services. To accomplish this, Illinois Bell would have to access the AT&T 5ESS and alter its call-routing software, a project that takes less than a few hours.

Frey said the bank has made telephone directories that list alternate telephone numbers to be used to complete internal calls during a disaster and has distributed them to all senior managers, officers and key administrators. All

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VIDEOCONFERENCING

National Gateway builds Boeing net

BY BOB WALLACE
Senior Editor

MONMOUTH JUNCTION, N.J. — National Gateway Telecom, Inc., based here, recently completed construction of a digital, five-node video teleconferencing network for The Boeing Co.

The network will simplify the aircraft maker's engineering, design review and manufacturing operations. The network comprises five nine-meter C-band satellite earth stations, owned by the vendor, at Boeing's sites in Philadelphia, Huntsville, Ala., Wichita, Kan., San Bernardino, Calif., and Puget Sound, Wash.

The network supports point-to-point and point-to-multipoint transmission at 768K bit/sec. It was designed and engineered by National Gateway Telecom and will be continually monitored from Boeing's Kent, Wash., facility.

This site, as well as two other Boeing locations in the Puget Sound area, is linked to a satellite uplink on Vachon Island in Puget Sound. Pacific Northwest Bell and

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CROSS TALK
BOB WALLACE

AT&T users' threats rouse giant to take action

Threatened with the loss of its largest and most prestigious telecommunications accounts, AT&T has responded by providing these coveted users with new or enhanced services.

The carrier, which has been frequently maligned for its lack of responsiveness to user needs, has gone to great lengths recently to avoid customer defections.

AT&T's delineation of plans to overhaul its Enhanced Private Switched Communications Service (EPSCS) network, a massive undertaking that AT&T billed as one of its largest customer network projects, serves as the most recent evidence of this trend ("AT&T agrees to upgrade EPSCS," NW, Nov. 30).

EPSCS users, representing some of the largest U.S.-based corporations, began prodding AT&T to offer a digital version of the analog voice service. When the carrier failed to respond to their pleas, several members of the EPSCS Users Group put together a network request for proposal explaining their need for a digital backbone net capable of carrying huge volumes of voice traffic. Faced with the prospect of losing key accounts to its competition, AT&T agreed to enhance EPSCS.

AT&T's Hospitality Network Service (HNS) pricing plan is another example of user-induced responsiveness. Fearful of losing at least four major hotel industry accounts to competing carriers,

AT&T introduced HNS early last month. Marriott Corp. was one of the users that prompted AT&T to create the new calling plan by threatening to abandon AT&T for other carriers' more attractive rates ("Users prod AT&T into new call plan," NW, Nov. 9). AT&T had estimated the loss of the four hotel accounts would represent a loss of \$118 million in revenue in 1988 alone.

Under HNS, which an AT&T official said is also targeted at hospitals and universities, users will pay 18 cents per minute of Message Telecommunications Service calls if they guarantee AT&T four million minutes of traffic per month for a full year. Each participating user will receive a five- to 30-cent per minute commission from AT&T if it delivers four million minutes of operator-assisted calls to the carrier per month for one year.

In August, AT&T mailed to selected customers a survey entitled "New Digital Data Transmission Services: Service Descriptions and Questionnaire" that described in detail four proposed digital transmission services. AT&T said this effort was part of an ongoing program to garner input from its customers and that it represents AT&T's effort to remain responsive to its customers. In mid-September, AT&T introduced Virtual Telecommunications Network Service (VTNS), which enables

See page 15

Another in a series of CLEO user applications

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Remote Sites Communication

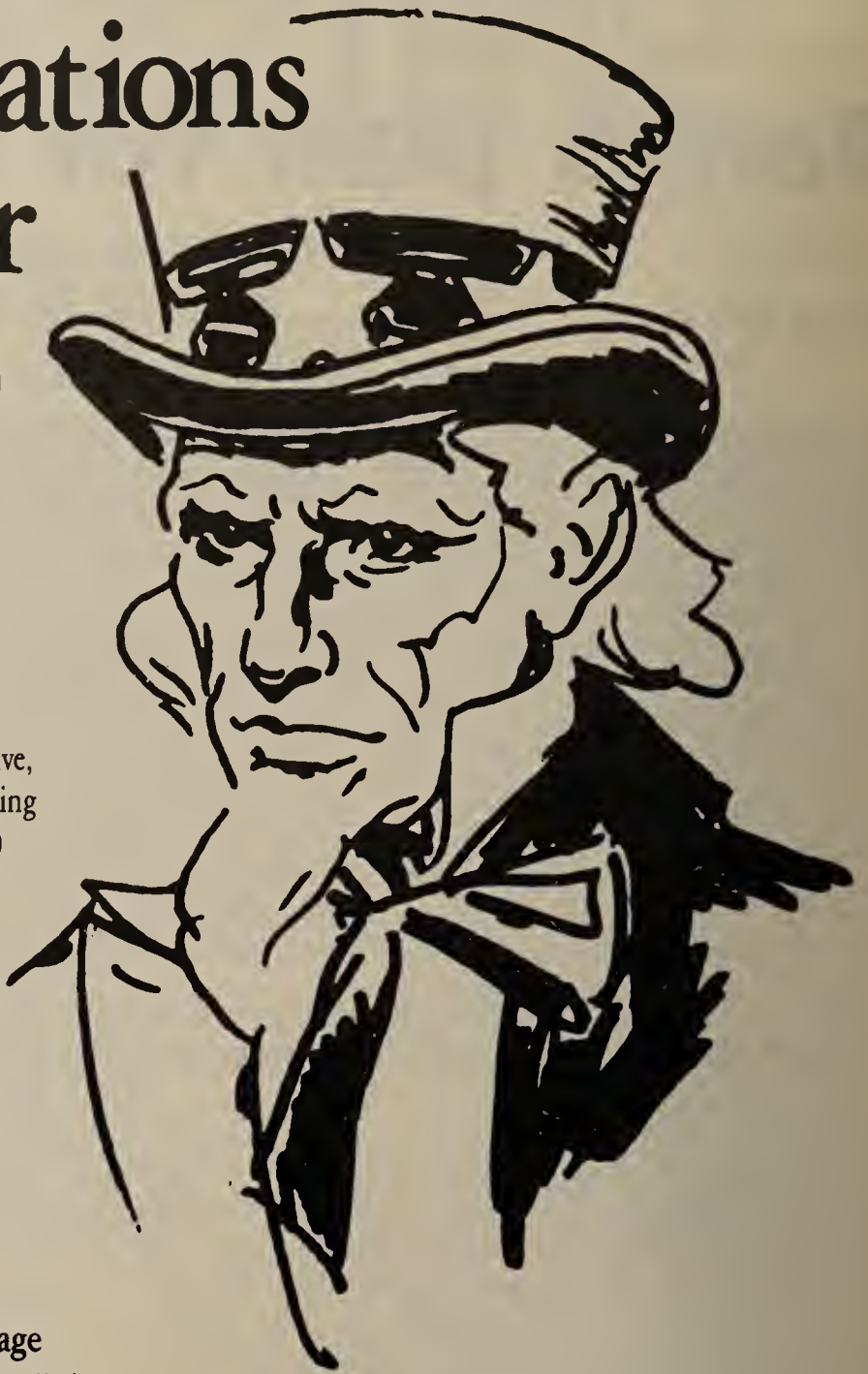
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Banks plan for net woes

continued from page 13

these users have second telephones on their desks — 75 in all — that are connected to the central office providing electronic services to bank employees.

End users with asynchronous integrated voice/data terminals (IVDT) can send messages to other departments in the same corporation. The message is sent from the modem-equipped IVDT over the Centrex line to the central office. The message is then sent back over a Centrex line to a modem connected to the bank's mainframe computers located in the bank's data center.

Although he said he was excited

about the BOC's ability to reroute calls, Frey said several users would have to share the cost of building a backup trading floor for the idea to become a palatable real-

"Now, if a cable is cut or burned, we can tell Illinois Bell which lines we need back up right away and which ones can wait."

ity. "This project is something that would be very difficult for any of banks to do on its own," Frey said. Building a trading floor, which requires specialized trading turrets and processing equipment, would

be an expensive proposition, he added.

As is often the case, it took a disaster to spur Continental Bank to redouble its efforts to create a contingency plan for its voice network. "We had a fire in one of the wiring closets in our headquarters

way of knowing which telephones were out of service," he said.

"When Illinois Bell began to restore service, a secretary's telephone may have become operational before a trader's telephone, because there was no way of knowing what lines were associated with each trunk," Frey said.

After the fire, Illinois Bell worked nonstop for several days to repair the cut trunks, the bank vice-president said. Illinois Bell "dedicated a large number of workers to the project. They also helped us out by identifying all the cables and trunks in the building," Frey said. "Now, if a cable is cut or burned, we can tell Illinois Bell which lines we need back up right away and which ones can wait." □

National Gateway builds Boeing net

continued from page 13

Telephone Utilities of Washington, a regional communications carrier, provided the transmission facilities needed to link the three sites to the island complex.

Stephen Lovas, domestic services vice-president for National Gateway Telecom, said Boeing's video teleconferencing network also uses some fiber-optic cable and microwave radio links, but he would not elaborate on where these transmission facilities are located.

National Gateway Telecom, which provides domestic voice, data and video networking services for businesses, media companies and government agencies, is a subsidiary of Pacific Telecom, Inc. National Gateway Telecom's FTC Communications, Inc. subsidiary sells international communications offerings, including voice, data and Telex services. □

Threats rouse AT&T to action

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the carrier to draw from its current array of calling services to build customized digital voice/data networks for large users. AT&T said VTNS was targeted at large companies that lack the resources needed to manage a large communications network. One of its largest EPSCS users, E.I. DuPont de Nemours & Co., Inc., signed on for VTNS in August. Sources estimated the value of the pact to be \$150 million to \$200 million.

In late April, AT&T filed a special tariff with the Federal Communications Commission to provide General Electric Co. with an integrated voice/data network using a proprietary switching technology referred to as Digital Telecommunications Switching System. GE signed a contract for the service in March.

As marketing wars between AT&T and its competitors intensify, AT&T will likely take less time to respond to the requests of its large customers, while seeking input from vertical industries representing users of all sizes. □



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DATA DELIVERY/ NET MANAGEMENT

► SATELLITE STRATEGY

Red Roof aims to dodge VAN fees with VSAT net

BY JOSH GONZE
Staff Writer

COLUMBUS, Ohio — In an early attempt to avoid access charges the FCC plans to levy on value-added network (VAN) providers, the Red Roof Inns, Inc. hotel chain said it will replace its VAN-based room reservation system with a \$2.5 million VSAT network.

Red Roof elected to move to a satellite-based service after members of its MIS department met with three commissioners of the Federal Communications Commission, including the current chairman, Dennis Patrick, in June. The meeting convinced them the proposed access charges will be implemented, according to Jeffrey Winslow, MIS director at Red Roof.

The FCC that month proposed forcing VAN providers such as CompuServe, Inc. to pay the same

type of local access charges that long-distance carriers pay for local exchange services. Both users and vendors have rallied to protest the proposal, and the issue still awaits final decision.

"After talking with them, I got the impression it was inevitable," Winslow said. "Everything they said was in the context of 'when it happens' and so forth."

Under the terms of its agreement with Atlanta-based Tridom Corp., Red Roof Inns will test the two-way satellite network in January, with production installations to begin in February. Tridom will install Ku-band very small aperture terminals at each of Red Roof's 185 hotels, which are located in 36 states in the U.S. The network is scheduled for completion in September 1988.

Winslow estimated that with the network's current design — utiliz-

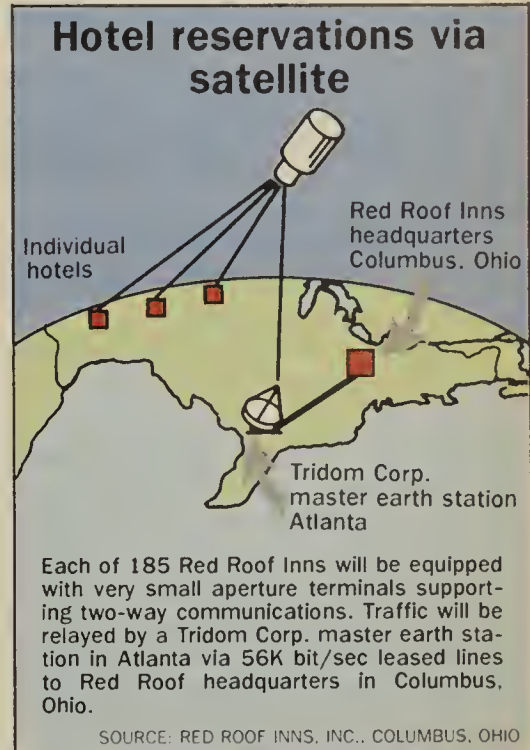
ing dial-up circuits for connections between CompuServe nodes and individual hotels — the cost of the access charges for Red Roof would total \$120,000 per month. Another option Red Roof considered for dodging the access charges was to lease lines between each hotel and the local CompuServe node; however, that would have cost roughly \$20,000 per month, Winslow said.

The hotel chain currently uses CompuServe to maintain response times of less than one minute among each of the 185 inns and the corporate headquarters here. Each inn is equipped with a Hewlett-Packard Co. model 1000 minicomputer and several peripherals such as card readers, printers and CRTs. Headquarters uses two HP model 3000 Series 70s to maintain a central data base of room reservations at all 185 inns.

The job facing Red Roof's MIS

Holiday credit cheer

Visa USA, Inc. expects its 156 million cardholders to charge \$11.5 billion worth of merchandise between Thanksgiving and Christmas this year. The credit card supplier said its worldwide network will process 12,000 transactions each minute and total 135 million transactions during the holiday season. The \$11.5 billion represents almost \$2 billion more than last year's total.



department — that of quickly establishing connections between each hotel and the central site — is made more difficult because customers have a choice of either making reservations at individual hotels or by calling Red Roof's 800 number, which is answered by reservation agents here. Winslow explained that the company main-

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DATA DIALOGUE

THOMAS W. MCDONALD

Dissecting the workings of network management

Network management has become the cornerstone of many companies' network strategies. Network operators continuously survey system components, detect exceptional events and solve network problems. Even though the process is carried out at every site, the activities conducted and the level of sophistication vary widely.

Some network management activities, especially those concerning network availability, can be easily understood. Availability concerns uptime, and connectivity and is the main responsibility of many network operators. An operator has to coordinate results from a broad spectrum of monitoring activities in a uniform fashion.

Operations concerning availability can be broken into two

sets of activities. The first is determining component status. For example, a determination might be made that an individual line on a T-1 multiplexer is behaving poorly.

The second activity is responding to a problem. For example, when a major processor or network switch fails, a company may switch to a backup facility or it may switch the data over an alternate route.

Monitoring a component's status can be done in a passive or active manner. Passive monitoring occurs when a device autonomously creates a message containing information on its status or the status of a device it controls and then forwards the information to a collection center.

The status could include statistical information, such as the amount of traffic the device handles in a given time. The collection center could be any central location that can dis-

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McDonald is principal consultant at MGT Technology Group, a consulting firm in Natick, Mass.

► RESERVATION NETWORKS

Texas Air files antitrust suit against American

BY MARY LINEHAN
Staff Writer

HOUSTON — The computer reservation subsidiary of Texas Air Corp. filed an antitrust suit against American Airlines, Inc. late last month, claiming American is trying to force Texas Air's reservation system out of the market.

The subsidiary, System One Direct Access, Inc., said American has engaged in a plan to exclude System One and other computer reservation systems (CRS) from the marketplace.

The complaint, filed in the U.S. District Court for the Southern District of Texas, described a "systematic pattern of actions undertaken by American since 1984 to unlawfully inhibit competition and to preserve market dominance achieved in a period prior to CRS rules."

In 1984, the Civil Aeronautics Board issued regulations that make it unlawful for CRS vendors to prevent, either directly or indirectly, a travel agency from using a competing system. System One claims in its suit that American's Sabre, the largest CRS in the country, has

a monopoly in many CRS markets. The suit named Dallas, where Sabre's market share exceeds 80%, as an example.

A System One spokesman said the company has not put a dollar amount on damages sought. An American spokesman declined to comment on the suit, other than to say the company was aware of it.

This suit marks the latest round in the battle for dominance among network airline reservation companies. American recently filed suit in federal district court in Fort Worth, Texas, on the grounds that Texas Air has illegally induced travel agents to leave the Sabre system and sign on with System One.

American is seeking millions of dollars in actual damages and \$100 million in lawyers' fees and punitive damages.

In published reports, System One has acknowledged underwriting suits filed by travel agents seeking dissolution of their Sabre contracts. Sabre's contracts with travel agents include "punitive damages," clauses that are invoked if the agent chooses to switch CRS vendors. ▮

Dissecting net management

continued from page 19

play or log the information. Products such as IBM's NetView and AT&T's Unified Network Management Architecture (UNMA) include collection centers.

Active monitoring takes place when a collection facility directly queries a device to check its status. The device performs the status check and responds with a message to the collection facility.

The monitored device or the central facility may translate this status information into an event. An event occurs when activities reported in status messages exceed a user-defined threshold.

Activities could include the error rate experienced over a line, the number of retries to a control unit or the loss of a conversation between two users. Activities such as response-time monitoring and communications processor cycle monitoring are not considered part of operations management.

The event's level of importance determines what action will be taken. Four actions are possible: the information could be written to an event log; the event could be shown on a console; an alert message could be sent to a network operator; or a predefined response could be triggered.

In most cases, customers would like to automate the first three actions so they would be transparent to the console operator. Indeed, most network management products have such capabilities.

There are two reasons for automating the fourth action. First, the volume of status messages is great and information comes from a number of sources, such as local-area networks, voice networks, host processors and application subsystems. Messages may roll off of the operator's console and into the log before they are seen.

Second, events often point to complex problems that require

Even though more than 25 companies are committed to NetView/PC and more vendors are attending the NetView/PC interface class, there is still skepticism.

timely and consistent reactions, such as dealing with failure of a major communications device. To deal with the problem, the company should have backup and recovery strategies in place. The actions could include restarting a device, implementing backup procedures and adjusting line speed through an intelligent modem.

Such routines must be coded in a language used by the network management system. For example, NetView uses Command Lists (CLISTS) to perform these tasks, and users of AT&T's UNMA write programs in C language.

These automated facilities can be implemented at various levels of sophistication, from simple responses to full-blown expert systems diagnosis. Programming these

tasks is not a trivial activity. The question must be asked: What level of automation provides reasonable assistance relative to the amount of work to implement these procedures?

Customers making network management purchases currently can choose from two types of systems.

IBM's NetView is clearly the market leader. Many managers respond to an Open Systems Interconnect (OSI) solution with, "That's great, but we run a Systems Network Architecture network, and I would like to manage my network from the same place where I manage the rest of my facility, a terminal attached to the host."

Many questions have been raised about NetView's shortcomings. Most of these center around NetView's ability to integrate non-IBM information.

NetView addresses the integration of information from multivendor networks through NetView/PC, a gateway between NetView and other manufacturers' network management facilities.

Even though more than 25 companies are committed to NetView/PC and more vendors are attending the NetView/PC interface class in significant numbers, there is still skepticism. Is NetView/PC robust enough to serve as a gateway to other vendors' equipment? Will IBM ever allow vendors to interface to NetView as a peer device? Will other vendors be able to extract data from a host via NetView/PC?

There are also competitive questions. Will vendors send critical information to NetView while they are maintaining proprietary management products of their own? If IBM announces a new NetView release, will the other vendors be forced to play catch-up?

Another concern is NetView's ability to automate many management functions. As networks become larger, network expertise becomes further diluted. Companies are trying to automate responses so they can reduce the number of trained personnel needed to run the network.

Some customers are choosing Cincom's Net/Master instead of NetView. These decisions can be traced to Net/Master's superior automation facility, Network Control Language (NCL), a fourth-generation language supplied with the product.

Gerald Haas, host support specialist at Northwest Mutual Life, said, "We are definitely keeping our eye on NetView. Eventually, that may be the way we want to go. We believe in the concept IBM is pitching with NetView. But it just seems that Net/Master is implementing those features today, while NetView is only promising them."

IBM is working to provide NetView with similar functions. The company has recognized the need to simplify the process. IBM

proved this when it began offering the NetView Solution Pac, which offers assistance in the production of automated facilities as a subset of a total NetView assistance package.

On the plus side, NetView is a defined architecture and is supported by real products, a claim that no other manufacturer can make. Also, the majority of NetView users, mostly Fortune 1,000 companies, are committed to the product.

A manager of network operations at an East Coast financial institution recently said, "It could prove out that the NetView solution doesn't work. A lot has to unfold, and I'm definitely not ready to convert to another solution yet. I sense that there are some problems, if not with the architecture, at least with the product implementation," he continued. "But I expect they can be worked out. For

"We believe in the concept of NetView. But it just seems that Net/Master is implementing those features today, while NetView is only promising them."

an early implementation of an architecture I think it's doing well."

NetView has been evolving from individual network management applications to a total system control package. Time will show whether NetView will mature to a full network operations management solution or whether it will become a subset of a hybrid solution.

Each vendor's solution has its own bias. An SNA network management architecture views the network from a mainframe perspective. Modem and multiplexer manufacturers tend to see the network from their equipment.

To succeed, a hybrid solution would have to be able to merge information from its own and other network management systems. Such a system would also have to provide an easy-to-use automated event-processing facility.

In the long run, a solution using NetView and NetView/PC as a subset of an integrated standard solution may well be the answer to corporate network management needs. AT&T's UNMA and US West, Inc.'s Netcenter are putting the pieces in place to offer such a solution.

Even though network management standards for the International Standards Organization's OSI have not been finalized, the model has gained support from a growing number of vendors.

Digital Equipment Corp., AT&T, Codex Corp., Racal-Milgo, Inc. and Digital Communications Associates, Inc. all said they will bring their products under the OSI umbrella. Despite the OSI flag-waving, it's not clear if vendors will design packages that can store information in a central collection facility. As customers gain more experience with such packages, their strengths and limitations will become clearer. □

Red Roof aims to dodge fees

continued from page 19

tains efficiency by operating according to the dictum "there should never be a situation where there is a room left to sell and both sides don't have access to it at any given time."

The two HP 3000s are connected via a set of five 9.6K bit/sec leased lines to the CompuServe central host, also located here. The CompuServe host is connected by CompuServe's network to remote nodes in each of the cities where Red Roof operates hotels. The remote nodes are equipped with autodial modems to establish connections with the local Red Roof Inn.

Winslow said the value-added network solution has performed well at a reasonable cost, which he would not disclose except to say it includes a flat monthly fee and a charge of less than 10 cents per 1,000 characters transmitted.

But the proposed access charges will add an unacceptably high cost in the form of connect-time fees, Winslow said. "The new ruling that's going down right now is going to kill us because we're going to be paying some amount per hour of connect time."

The X.25-compliant VSAT network slotted to replace the value-added network will handle the same services, Winslow said. A pair of 56K bit/sec leased lines will connect Red Roof's central site here to the Tridom master earth station in Atlanta.

"The VSAT network can give us the identical service that CompuServe used to, with an X.25 protocol, so we can replace our network without any software changes on our part," he said. "We'll send our traffic out the same way, and it will do the same things."

Use of a satellite system will provide several advantages over the CompuServe network. Response times will drop from one minute to half a second, and it will be possible to use the network economically for applications other than reservations. Those applications may include electronic mail, electronic funds transfer and electronic credit card authorization. The per-character charge prevents Red Roof from running those applications economically on the value-added network.

The cost of the VSAT network will be comparable to that of the value-added network, Winslow said. "When we looked at the upcoming surcharges, it makes VSATs look very attractive. We were surprised when the final numbers were on the table, and that it was just about a break-even with CompuServe." According to the vendor, the contract is valued at more than \$2.5 million.

One of the reasons Red Roof considered Tridom in the first place was that Days Inns Corp., another hotel chain, already uses Tridom's VSAT network, Winslow said. "One of the reasons we looked at Tridom was they were the only satellite company serving the hotel industry." □

LOCAL NETWORKING

“The degree of integration you have in a [work group] network looks fine until you try to communicate beyond your environment.”

Jan Lewis

President

Lewis Research Corp., a consulting firm
Palo Alto, Calif.

► XEROX NETWORK SYSTEMS

Bridge unveils net server running XNS

BY JOSH GONZE

Staff Writer

MOUNTAIN VIEW, Calif. — Bridge Communications, Inc. last month took the wraps off a personal computer-based server that supports local-area networks running the Xerox Network Systems (XNS) protocols.

Designed for use in networks of up to 5,000 users, according to Bridge, the NCS/AT-XNS allows centralized control and monitoring of computing resources on an XNS-based IEEE 802.3 network.

The server logs network activity through a system audit trail, performs real-time monitoring of critical network parameters and graphically analyzes data to determine trends. To guard against network downtime, NCS/AT-XNS includes an automatic back-up feature: If one NCS/AT-XNS on the network fails, another can be designated by the user to become the primary unit. The backup unit automatically assumes functions such as boot-load service, clearinghouse name service, macros, and configuration file service and records.

The server records and time-stamps information on all network connections attempted, completed and terminated. The records show connection source and address, status, duration and traffic in packets and bytes. In addition, the unit monitors network parameters such as bootstrap and upload initiation, error statistics, server activity and network utilization, in real time.

Alarms on the NCS/AT-XNS console notify the network manager when errors exceed specified levels. Error categories include problems with user ports, collisions of data packets and alignment errors that signal overstuffed packets. Those alarms, also logged on disk, are used by the NCS/AT-XNS to generate trend graphs.

Each network-attached server can store up to 2,048 logical names and configuration information down to the port level. A central file stores up to 2,048 user-defined macros, miniprograms that automate specific tasks and let the user execute complex command sequences easily.

The brain of the NCS/AT-XNS server is Bridge's ILANA/AT (Intelligent LAN Adaptor/AT), an IBM Personal Computer AT bus board that fits in a slot in the microcomputer's chassis to provide an Ethernet or broadband network connection. The Personal Computer AT must have a 40M-byte hard disk and must run the Xenix operating system.

Network management software runs as an application on the Xenix operating system, which provides a multitasking environment. See page 22

► CONTINUOUS PROCESSING

Ample supply stabilizes industrial net demand

Automation has not fostered plantwide integration.

BY MARY LINEHAN

Staff Writer

NATICK, Mass. — Demand for industrial local networks in continuous processing environments leveled off in recent years because users are satisfied with the partial level of process automation and integration they have achieved, according to a report released here late last month.

In its report, Venture Development Corp. (VDC) said automation in process control applications has not led to the rapid plantwide integration anticipated by most industry experts. A

spokesman for VDC attributed the slower growth in industrial local networks in the continuous processing industries to heavy saturation of that market.

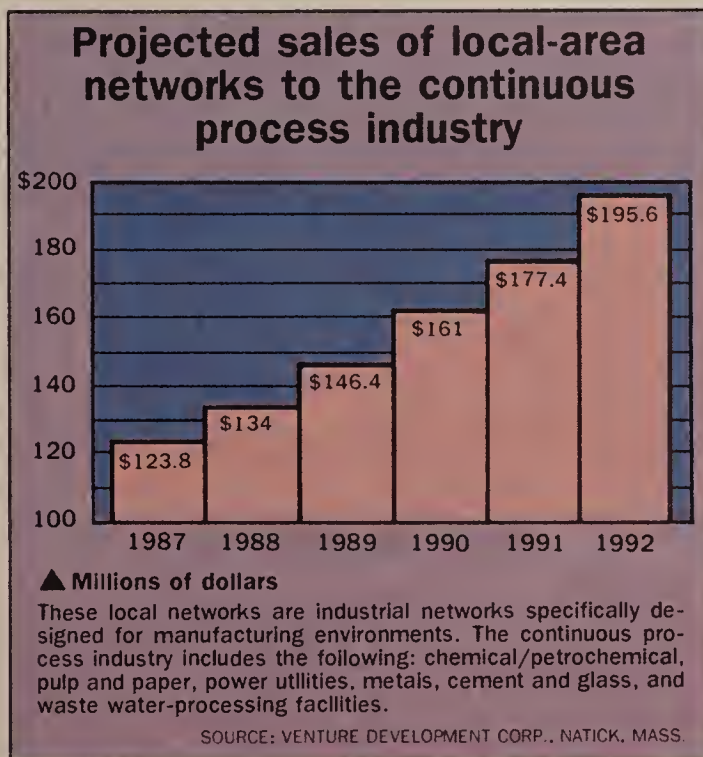
VDC's report, titled "Factory Communication: Part II — Continuous Processes," said demand for industrial local networks in continuous process industries, such as chemical and petrochemical manufacturing, oil refining and utilities, has slowed in the past two or three years, after it had flourished in the early 1980s.

Valued at \$123.8 million in 1987, the market for industrial local-area networks in continuous processing environments is expected to grow at 9.6% annually and to reach \$195.6 million by 1992. The report said 9.6% growth is about half of what is expected in discrete and batch manufacturing environments, such as the automotive and aerospace industries.

The report was based on interviews with about 100 major vendors — including Honeywell, Inc. and Digital Equipment Corp. — that sell to continuous processing companies and more than 100 users "in all major industry segments with continuous processing environments," according to James K. Brown, a market analyst for VDC. Revenues from sales of industrial local-area networks in the discrete and batch manufacturing industries are expected to grow at about 20% per year.

Brown said the slower growth rate in the continuous processing industries is due to a saturation of that market. "Distributed control systems, which are a large portion of industrial local-area network shipments, have been

See page 22



NETWORK NOTES

Bravo Communications, Inc. unveiled a 10-port printer-sharing device that enables up to eight IBM-compatible and Wang Laboratories, Inc. personal computers to share two printers over parallel cable distances of up to 3,000 feet.

The **CP/1082**, the high end of Bravo's line of printer sharers, is designed to provide print sharing at about \$60 per connection. Bravo intends the device to serve as an add-on or, in some cases, as an alternative to a local-area network for general office applications. The printers can be either dot-matrix or laser devices.

The printer sharer uses the computers' parallel ports, eliminating the need for serial-to-parallel conversion and freeing serial ports for other

applications.

Installation requires no special software or port configuration, Bravo said. Using standard cabling, the CPS/1082 is compatible with both Centronics 36-pin parallel and IBM 25-pin parallel interfaces.

The device is priced at \$599. Bravo is based in San Jose, Calif.

Control Data Business Centers (CDBC), a Minneapolis-based unit of Control Data Corp., added to its Orchestrator line of micro-to-mainframe programs a microcomputer package that lets users communicate with CDBC's mainframe services.

The new package, called Orchestrator Premier, is a data entry and communications

program that accesses CDBC-provided mainframe applications such as payroll, tax filing, accounts payable, accounts receivable and general ledger.

The new personal computer software includes modules for reporting, file translation and communications. In addition, features include password and functional security, help menus, special edit routines, and simple menu structure and data access.

Control Data provides a nationwide data service network to make the long-distance connection between the user's personal computer and CDBC's mainframe.

The Orchestrator Premier costs \$3,000 for new users.

See page 22

Supply stabilizes net demand

continued from page 21

around since 1975," Brown said. "Many people have already replaced traditional controls with these distributed control systems. Therefore, there is a larger installed base in this market."

Brown defined distributed control systems as those typically used in continuous process environments to connect production controllers for different processes into a network. The net, he said, can then be controlled by a computer. Brown noted that distributed control systems are usually sold as a package.

"Industrial local-area networks

in discrete and batch manufacturing are most often used in new plants and plant expansion projects," Brown said. "Networks in continuous processing are most often bought to retrofit existing systems."

The report also indicated that a key factor in the slower growth of industrial local nets is the conservative attitudes of designers and systems planners in continuous process companies. According to a VDC user survey cited in the report, that conservatism stems from concerns about local network reliability, and it slows implementation of new technologies.

"A breakdown in communications may not only mean the loss of hundreds of thousands of dollars

from production stoppage but can also have dangerous consequences, such as generation of toxic fumes, product spoilage or [possible] explosions," the report said.

With reliability as a key issue in continuous processing environments, new technologies are avoided. "Brand loyalty is incessant in continuous manufacturing," according to Brown.

"Users tend to remain faithful to the technology they know best and the technology that has worked well for them in the past," he said. "Before employing a new distributed control system in their own facilities, many users want to see it working in a similar application at another process facility."

An earlier VDC report, released

in late September, "Factory Communications: Part I — Discrete and Batch Manufacturing," labeled Manufacturing Automation Protocol and Ethernet networks as the top networks at the plant level. The report concluded that both MAP and Ethernet have the capability to carve out large niches in the discrete and batch industries.

"Factory Communications: Part I — Discrete and Batch Manufacturing," a 365-page report, is priced at \$4,950. "Factory Communications: Part II — Continuous Processes," a 350-page report, is also priced at \$4,950. For information on either report, contact Venture Development, One Apple Hill, Natick, Mass. 01760, or call (617) 653-9000. **□**



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Network Notes from page 21

Dialcom, Inc. released a new version of its personal computer electronic mail software that eliminates the copy protection function. The package, dubbed UpFront, enables users of IBM compatibles to link into the Dialcom network for public E-mail services.

UpFront sends all prepared messages and receives those waiting. It provides a full-screen editor for creating messages, right-margin justification, string search capability, and block movement and insertion of text.

The software has a file folder system to allow users to keep track of all messages. It also supports an address book that keeps track of E-mail ID's and telex numbers, and an electronic forms feature for creating invoices, sales reports and other forms. The forms and information contained within can be distributed via Dialcom.

UpFront is available on 3½-inch diskettes and on regular-sized diskettes. Dialcom is located at 6120 Executive Blvd., Rockville, Md. 20852, or call (301) 881-9020. **□**

Bridge unveils net server

continued from page 21

ronment, according to a Bridge spokesman.

The new unit is an XNS-based version of the NCS/AT that Bridge introduced in March to work with networks based on the Transmission Control Protocol/Internet Protocol. Buyers of the product must specify which version they want, according to Nadia Mansour, product manager at Bridge.

The new server features a system utility and the automatic backup. Sysgen is used to customize the server's system generation parameters to address specific user applications. Bridge has priced the NCS/AT-XNS at \$12,900, PC AT included. Users can upgrade an existing Personal Computer AT or compatible with a \$5,000 upgrade kit that includes the ILANA/AT board, NCS software and the Xenix operating system.

Bridge, which recently merged with 3Com Corp., is located at 2081 Stierlin Road, Mountain View, Calif. 94043. **□**

COMMUNICATIONS MANAGER

“The vast majority of business executives have no interest in technology. They have a great deal of interest in the bottom line, however, and that is the way for communications managers to sell technology. We tell our clients to relate technology to the bottom line by finding solutions that save money and open new markets.

Michael Dillingham
Executive vice-president
Comsul Ltd.

A consulting company in Houston

► REORGANIZATION

Stanford unites voice with data

Consolidation improves net control.

BY MICHAEL FAHEY
Senior Writer

STANFORD, Calif. — Consolidating voice and data communications into one department has enabled Stanford University to assume greater control over its entire communications operation here.

The move, which took place this summer, has broken down barriers between the formerly separate staffs, according to Bill Yount, director of data networking and communications systems and head of the consolidated communications

department.

Before the consolidation, Yount was responsible for the installation and operation of Stanford's two, campuswide local-area networks.

Yount pointed to two pilot projects using nonshielded twisted-pair wiring to transport data as benefits of the reorganization. In one project, the university is implementing 3Com Corp.'s version of Ethernet to net computers using twisted-pair wiring. In the other, the university is using PhoneNet from Farallon Computing to connect Macintosh personal computers using twisted-pair wiring.

“Prior to the reorganization, there were organizational impediments to even considering things that were technically feasible and useful,” Yount said. “For example, there was not much encouragement for finding innovative uses for our unused twisted pair.”

As another example of the benefits wrought by the change, Yount cited Stanford's campuswide fiber-optic cabling, which was previously controlled and used by the telecommunications department. That cabling will now be available for all voice and data transmissions.

The move to unite all communications operations into one department came about after Stanford consolidated management of all its information and computer systems under Bob Street, who serves as vice-president of information services. He also reports directly to the university president.

“Previously, computing, information systems and communications were divided among a fairly

large group of people,” Yount said. “The change resulted from a recognition of the value of having a chief information officer who reports directly to the president.”

The former director of telecommunications, Jan Thomas, reports to Yount, who now heads up a staff of about 100. In his previous position, Yount's staff numbered between 10 and 15 people.

In addition to gaining a much larger staff, Yount assumed responsibility for much more new hardware, including a 14,000-line Northern Telecom, Inc. SL-100 private branch exchange and a Gandalf Data, Inc. data switch. “We act as our own telephone company,” he said.

He conceded that many data communications veterans look down their noses at telecommunications personnel, but said such snobbery is unjustified. “Modern PBXs are sophisticated computer switching devices, so those who

See page 26

GUIDELINES RICK MARGOLIS

Strategies for middle managers

Middle managers are people caught between a rock and a hard place. As managers in charge of a group, profit center or business unit, middle managers occupy ill-defined and often underappreciated roles in the organizational stratum between upper level managers and subordinates.

Middle managers are expected to carry out complex assignments with minimal formal authority. They must have general managerial skills and knowledge while functioning as hands-on, technical specialists. As people in the middle, they must juggle multiple relationships among superiors, colleagues and subordinates, who often have conflicting demands and expectations.

Middle managers must skillfully translate management's goals into subordinates' actions. The results of these actions must in turn be converted into quantifiable results for superiors.

As bureaucracies are pared down to increase effectiveness, competitiveness and profitability, middle managers are increasingly expected to become more efficient and innovative. It's no wonder many middle managers feel overwhelmed and stressed.

How is it possible to work well in the middle? Let's examine some of the strategies successful middle managers use to create personally meaningful and satisfying work, to gain control and direction over their jobs and to perform effectively and innovatively.

Margolis is director of program development for MAGE Centers for Management Development, a management consulting firm in Boston, Montreal and Toronto.

Initially, many effective middle managers create a personal vision. This vision explores alternatives beyond the existing organizational framework. The vision portrays a desired state in which middle managers and their units may contribute to the mission of the organization. These visions should never be self-serving. Also, they do not usually chart a practical course — that comes later.

The primary purpose of visions is to encourage people to discover some beneficial possibilities for their organizations and themselves and to develop personal initiative.

After envisioning a desired future, innovative managers develop projects consistent with their ideals. These projects may include identifying markets, changing pricing policies, developing quality control standards and methods, and designing and implementing new information systems for financial reporting in the business sector.

Middle managers then engage in collecting accurate data to verify their organizations' needs for projects and to diagnose potential opportunities and obstacles. The organizational, technical and political information gathered during this phase of project definition will be used to fashion a proposal to sell to superiors. The support of higher level management is indispensable in accomplishing the desired objectives.

But cynics remind us that good ideas are a dime a dozen, and a multitude of potentially excellent projects die premature deaths all over corporate America every year.

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Telecommunications executive profile

Average age:	43
Average number of years in telecommunications:	14.6
Average number of years with current employer:	10
Average number of years at current job level:	4.3
Average number of different employers in telecommunications career:	2
Average number of employees supervised:	29

Profile of communications professionals with title of vice-president or director

SOURCE: INTERNATIONAL COMMUNICATIONS ASSOCIATION, DALLAS

ASSOCIATIONS

The Tele-Communications Association held a training session for new officers in conjunction with its board of directors meeting, which was held in Phoenix last week. The group recently elected more than 30 officers, including new chapter presidents, who will take office Jan. 1.

Elections

Elected chapter president for the Greater San Diego chapter was Ronald Scott, manager of telecommunications, Cubic Corp., San Diego; for the Southern California chapter, Larry Nelson, vice-president of telecommunications technical services, Union Bank, Monterey Park, Calif.; and for the Northern California chapter, John Dinan, telecommunications specialist, Santa Clara County, San Jose, Calif.

President of the Northwest chapter will be Carol Mathers, project analyst, Boeing Computer Services Co., Seattle; of the Oregon chapter, Robert Bitter; of the Colorado chapter, Jerry Greer, systems administrator, Colorado National Bank, Denver; and of the Arizona chapter, Rob McCrory, director of telecommunications, Samaritan Hospital Services, Phoenix. □



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T-1 PLANNING INTEGRATED CORPORATE NETWORKS

Dr. John McQuillan, President, McQuillan Consulting



This intensive, one-day seminar instructs you on planning issues for integrating packet, circuit, and channel switching; SNA and X.25; and voice and data in a corporate network strategy. You will address the role ISDN will play, as well as enterprise-wide networking and bandwidth-intensive applications.

Level: Intermediate.

T-2 MULTIVENDOR/MULTIARCHITECTURE LANS: MAKING THEM WORK

Dr. Kenneth Thurber, President, Architecture Technology



Attend this tutorial for a comprehensive overview of today's LAN environments. Discussion will include how to tie diverse and often incompatible network elements together in a manageable, logical way, as well as alternatives to LANs. Level: Advanced.

T-3 ISDN: STANDARDS, PRODUCTS AND SERVICES

James G. Herman, Independent Consultant, and Mary Johnston, Senior Consultant, Telecommunications Consulting Group at BBN



ISDN is fast approaching. Some say with too little agreement on fundamental standards and applications. Attend this highly focused, intensive session to anticipate the emerging standards, vendor trials, conflicts, successes, products and service offerings that will emerge over the next several years.

Level: Intermediate.

T-4 MULTIVENDOR NETWORK MANAGEMENT

Jerry McDowell, Vice President, Vanguard Telecommunications Inc.



Enroll in this intensive tutorial for skills in how to manage a network which links multiple carriers and a variety of hardware and software vendors in one corporate network. You will learn how to take control into your own hands and avoid finger pointing, acrimony and poor service. Level: Intermediate.

T-5 HOW TO BECOME A BETTER TELECOMMUNICATIONS MANAGER

Gerald P. Ryan, President, Connections Telecommunications Inc.



Today's network manager must not only understand new technologies and standards, but must also play many roles in the company. Attend this instructive tutorial for an entertaining and thought-provoking look at what you need to know to be a successful network manager, plus the tools, processes, and organization that will maximize your efficiency. Level: Intermediate.

T-6 THE LATEST LOOK AT NETWORK STANDARDS AND OSI

Richard desJardins, Director of Technology R&D, Computer Technology Associates Inc.



As OSI and the older standards are reaching maturity, numerous new standards are in the works. Attend this intensive session for a look at the new generation of standards — including their purpose, significance, applications, and technical elements. Level: Introductory.

T-7 MODELING AND DESIGNING DATA AND INTEGRATED NETWORKS

Dr. Wushow Chou, Professor of Computer Science and Electrical and Computer Engineering, North Carolina State University



Enroll in this tutorial for detailed instructions on how to design integrated networks. You'll learn about combining voice and data on a single architecture to maximize the efficiencies of wideband services, the migration from classical multipoint to distributed systems, plus cost-efficiency issues and other practical considerations. Level: Advanced.

T-8 IBM NETVIEW: INDUSTRY WIDE IMPLICATIONS

Atul Kapoor, Vice President, Kaptronix Inc.



This tutorial gives you a thorough and comprehensive introduction to IBM's NetView and NetView/PC — their operation, technical specs, dependencies and functional interactions, plus an analysis of their impact on the industry, significance for users, and practical suggestions for implementation.

Level: Intermediate.

T-9 OPEN NETWORK ARCHITECTURE: CARRIER/VENDOR/USER IMPLICATIONS

Haines Gaffner, President, LINK Resources Corp.



The FCC has ordered AT&T and the RBOCs to adopt ONA to stimulate competition in enhanced data processing services over public switched networks. Enroll in this tutorial to learn the details of the ruling, its implications for service offerings and an overview of who the players will be.

Level: Intermediate.

T-10 INTERNATIONAL NETWORKS: SOLVING THE PRACTICAL PROBLEMS

Len Elfenbein, President, Lynx Technologies Inc.



Attend this tutorial if your company is expanding its network outside the U.S. You'll receive immediately useful information on tariffs, rules, how to handle ordering and service delays, the role of the PTTs, how to deal with the lack of consistency from country to country, and many more issues you must confront to succeed. Level: Intermediate.

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T-11 BUILDING THE NETWORK CONTROL CENTER

Gabe Kasperek, President, Kazcom Inc.



This one-day course will help you successfully operate a network control center on a day-to-day level. You will focus on the practical requirements, functions to be performed, systems and tools available and how to put them all together to gain control over your network. **Level:** Introductory.

T-12 REGULATORY ISSUES AND ANSWERS

Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding



Take this comprehensive seminar to make sense of the increasingly complex regulatory environment. You will receive a thorough briefing on the legal, social, and regulatory issues, the evolution of vendor technology and industry standards, and significant developments affecting the coming regulatory year. **Level:** Intermediate.

T-13 INTRODUCTION TO DATA COMMUNICATIONS

Gary Audin, President, Delphi Inc.



This perennially popular tutorial provides exactly the right mix of concept, technology, and application for the beginner to get a good foundation in data communications. The course notes are excellent reference material and the instructor is one of the most highly regarded professionals in the industry. **Level:** Introductory.

T-14 INTRODUCTION TO VOICE COMMUNICATIONS AND PBX

James Morgan, Principal, J.H. Morgan Consultants



Enroll in this full-day tutorial for a comprehensive foundation in the basics of voice communications — technology, PBX characteristics, switched networks, tariffs and services, as well as an overview of traffic engineering. **Level:** Introductory.

T-15 IMPACT OF THE NEW POST-DIVESTITURE TARIFFS ON LARGE NETWORKS

Robert L. Ellis, President, The Aries Group



In this intensive tutorial you will learn the structure of the post-divestiture tariffs, the latest January 1988 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics in configuring data networks, the LATA-pure strategy and federal access tariffs and how to use them. **Level:** Intermediate.

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Strategies for middle managers

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A key ingredient for working effectively in the middle — and, unfortunately, one of the most misunderstood and neglected of all managerial skills — is coalition building. Middle managers need to develop networks of backers to provide support and resources prior to beginning a project.

After identifying these factors, effective managers engage in dialogues with all the necessary participants to discover who shares their vision and intentions, who is resistant, who is sitting on the fence and who couldn't care less.

Allies may be particularly help-

ful in providing additional useful information. They may be particularly adept at highlighting missing information in our proposal. Some opponents may offer criticisms and objections that can be used to refine and strengthen the project.

The middle manager may be able to negotiate points of agreement or exchanges of resources with opponents that will prove to be mutually beneficial.

The process of developing support for a defined project typically extends beyond a particular unit of an organization. A marketing manager may discover that he must obtain a critical appropriation from a particular member of the financial administration unit. An engineering department manager could dis-

cover that she needs various product managers' endorsements to gain the necessary leverage to display her design models.

Accordingly, middle managers must be prepared to evaluate their proposals in terms of the applicability and benefits to other constituencies in the organization.

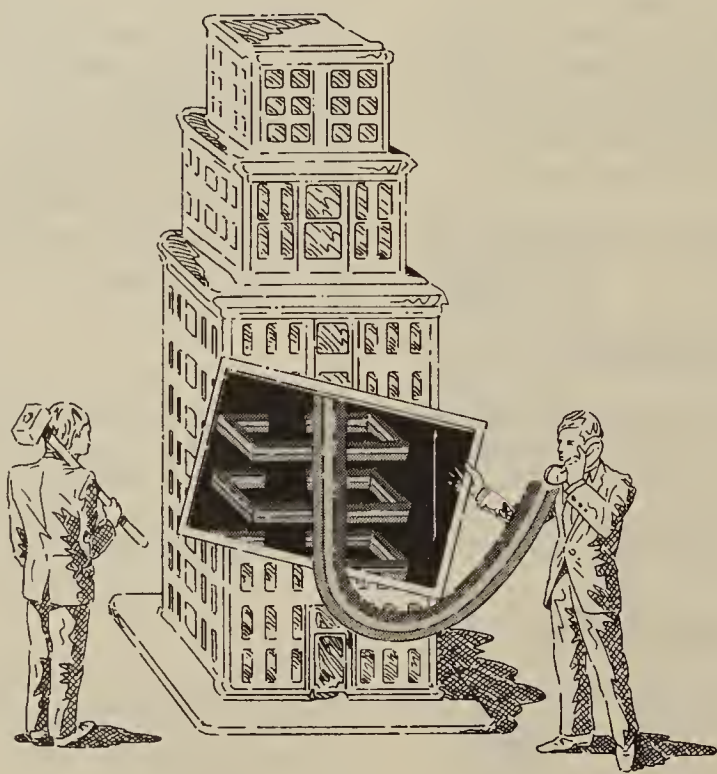
Having developed a personal vision, carefully defined a project and built a supportive coalition, the middle manager is finally ready to act.

But after all these careful preparations, difficulties and challenges still arise. Surprisingly, resistance that was previously unvoiced sometime surfaces. Minor objections to procedures, missed deadlines and disagreements over re-

source allocations can spring up. The middle manager is again required to engage in informal dialogues and formal meetings to deal with the resistance adequately.

During the action phase, managers will need to maintain the momentum of the project and even redesign some of the planned tactics or strategies in order to keep the project progressing.

Working effectively and innovatively in the middle is a complex task that requires managers to strive to create personal visions, plan projects and actions, develop interpersonal relationships and persevere through setbacks and challenges. But the resulting organizational and personal benefits are well worth the trouble. ▮



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1 716 879-8100

Standard
Telecommunications
Systems, Inc.
1 212 532-5440

Tecnimat/TDS
1 800 524-0646

Tel Plus
Communications, Inc.
1 800 TEL-PLUS

Twin State CCS
1 800 833-8000

Stanford unites voice with data

continued from page 23

look down on them are looking down on themselves," he said.

Yount said that, in addition to learning the new technology involved in telecommunications, he is faced with learning the economic side of wide-area communications, which, with its tariffs and regulatory issues, is radically different from the economic side of local-area networking.

He called the new job "both challenging and confining." The challenge, he said, comes in overseeing a larger staff and learning new technology. It is confining compared with his old job, however, where he was freer to experiment with new technology.

Yount said both the data communications and telecommunications personnel will benefit from the consolidation. "The people who came from the telephone side and the people who were involved in switching data through the Gandalf switch will learn about local-area networking, which is a new technology," Yount said. "And the people on the computer networking side will learn effective ways to support external users that want to access the network."

He and his staff are currently studying ways that Integrated Services Digital Network can be combined with the university's local-area networks. "We might, for example, want to pass end-to-end TCP/IP services from an ISDN device through a switch into our local-area networks."

While Yount, who first began working with computers and computer communications in 1958, said he believes Stanford's decision to integrate its communications staffs was a wise one, he is not a proponent of integrated voice and data communications.

"There are advantages in combining voice and data communications for specific reasons," he said. "I don't, however, believe in the integration of all voice and data technologies in one facility. The PBX is limited in its processing power. I don't believe there is a PBX that is as effective in switching voice and data as it is to switch those services separately." ▮

NEW PRODUCTS AND SERVICES

See inside for:

- Digitech protocol analyzer
- FTC messaging software
- Infotron LAN Span

► PRODUCT ENHANCEMENTS

Netlink boosts IBM SNA gateway

SNA-Gate supports 64K line speeds.

BY JIM BROWN
New Products Editor

RALEIGH, N.C. — Netlink, Inc. last week enhanced its IBM SNA gateway by increasing both gateway-to-host and terminal-to-gateway link speeds and enabling terminals to establish multiple sessions with an IBM host.

With the addition of a V.35 interface board and Release 1.7 of its operating software, SNA-Gate will now support a 64K bit/sec host link under the Systems Network Architecture/Synchronous Data Link Control protocols. Previously, the gateway supported a 19.2K bit/sec link to the host. The gateway allows ASCII devices and Binary Synchronous Communications devices to link to an SNA network.

With the new software, terminals and other peripherals supporting BSC protocols are now able

to link to an SNA-Gate via one of two 9.6K bit/sec lines. Previous models enabled BSC devices to link to the gateway via a single 9.6K bit/sec line or multiple slower speed lines.

In addition to the dual 9.6K bit/sec links between BSC devices and the gateway, the new software enables the SNA-Gate to be configured to support five 4.8K bit/sec, 10 2,400 bit/sec or 16 1,200 bit/sec links between BSC devices and the gateway. This capability enables users to attach a multidrop circuit supporting up to 15 BSC devices to a single gateway port.

The software also enables BSC, asynchronous ASCII terminals or IBM Personal Computers emulating an asynchronous ASCII terminal to establish and toggle between multiple mainframe sessions. Although there is no limit to the number of sessions each SNA-Gate-attached terminal can establish, the SNA-

Gate itself will support a total of 255 SNA sessions.

The new software release also supports file transfers between SNA-Gate-attached personal computers and the host via such file transfer packages as VM Personal Computing, Inc.'s Relay Gold.

Netlink offers three SNA-Gate models, including one that enables asynchronous ASCII terminals and personal computers emulating ASCII terminals to link to an SNA network and operate as IBM 3270-type devices, such as an IBM 3278 or 3279 terminal. Another model supports connection of BSC devices to an SNA network, and the third model links both asynchronous and BSC devices to SNA nets.

With the SNA-Gate, those BSC devices, asynchronous ASCII terminals or personal computers can establish SNA LU Type 0, 1, 2 or 3 sessions with an IBM host.

The price of a SNA-Gate supporting both the new software release and the V.35 interface ranges from \$6,000 to \$12,000, depending on the number of ports. Existing SNA-Gate users can upgrade to the new software for \$200 and can purchase a V.35 interface board for \$2,000.

Netlink is located at 3214 Spring Forest Road, Raleigh, N.C. 27604, or call (919) 878-8612. □

► PBX PRODUCTS

NTI tool eases file upgrades

BY MARY LINEHAN
Staff Writer

NASHVILLE — Northern Telecom, Inc. recently introduced software that aids in the loading and maintenance of station data base files used by Meridian SL-1 private branch exchanges.

According to the vendor, station data base information tells Meridian SL-1 systems which directory numbers, features and calling privileges are assigned to each telephone set. The software allows users to easily create and alter blocks of station data base information stored by Meridian SL-1s.

The software runs on an IBM Personal Computer or compatible with a minimum of 512K bytes of internal memory, 10M bytes of hard disk storage, a Hayes Microcomputer Products, Inc.-compatible modem, a printer and a color or black-and-white monitor.

According to Northern Telecom, the personal computer displays a series of data entry screens that the operator uses to enter data base information. The software, which allows users to create templates that reduce repetitive data entry when similar phone sets are being programmed, verifies the entered data for proper format and numerical range conformance.

The software also enables users to enter station data base information into a personal computer, allowing the station data base to be created before the Northern Telecom system is installed.

According to the vendor, software modules are provided to allow station data to be sent to and retrieved from the system. The software can also assign directory numbers automatically and make global data base changes.

A report generator provided with the software facilitates the creation of custom reports that provide directories and lists of feature groups. Standard reports such as hunt chains, unused directory numbers and equipment inventory lists can also be produced.

Single copy licenses for the new software are available for \$7,500, and corporate licenses are available for \$85,000.

Northern Telecom, a subsidiary of Northern Telecom, Ltd., is located at 200 Athens Way, Nashville, Tenn. 37228, or call (615) 734-4000. □

► MULTIPOINT NETWORKS, INC.

Radio supports multipoint networks

BY JIM BROWN
New Products Editor

SAN CARLOS, Calif. — Multipoint Networks, Inc. recently introduced a two-way radio that can support a multipoint network linking a data center to remote sites within a radius of 30 miles.

The firm's Multipoint 19 system consists of a master radio that enables a host computer to communicate with terminals or other data terminal equipment (DTE) linked to remote radios. The master radio is capable of transmitting synchronous data to remote radios at speeds up to 19.2K bit/sec and asynchronous data at up to 72K bit/sec. The remote radio can broadcast data at the same speeds.

In addition to supporting half- or full-duplex interactive transmissions in a polled environment, the master radio can also be configured to broadcast single messages to all remote locations.

Multipoint 19 is being positioned as an alternative to leased point-to-point and multipoint

lines. The product also makes communications possible between sites not now served by leased lines and will support a multipoint net that exceeds the 15 drops typically supported by a leased multidrop circuit. A network of Multipoint 19 radios can number between 20 and 40, depending on geographic limitations and the amount of traffic.

The master radio links to a host computer or front-end processor via an RS-232 cable. Remote radios are linked to terminals or other DTE via RS-232. Each remote radio receives all broadcast data packets. However, the radio passes only data addressed to that site to the attached DTE.

Each remote radio can support multiple devices through a port-sharing device. Each radio will also support a string of terminals linked in a daisy-chain fashion.

Multipoint 19 comes in a stand-alone desktop unit or in a rack-mountable version. Each has front-panel LED indicators that show when data is being

broadcast or received. The LEDs display receive-signal quality.

Users must gain a Federal Communications Commission license to broadcast at specified frequencies, thus providing frequency coordination in congested metropolitan areas.

A Multipoint 19 network experiences propagation delays similar to those of a cellular radio, a company spokesman said. As with microwave radio networks, Multipoint 19 requires a line-of-sight transmission path between the master radio and each remote radio. But that line-of-sight requirement is not as rigid as that of microwave.

Multipoint master and remote radios are priced between \$2,700 and \$4,000 each, depending on the maximum speeds supported. That price does not include the antenna cost, which can average between \$100 and \$200 for each radio.

Multipoint Networks is located at 953 Washington St., San Carlos, Calif. 94070, or call (415) 594-3728. □



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prising the CROSSNET™ system, these smart products make possible single-point network control and decidedly intelligent network management.

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Find out how CROSSNET is that smart network solution you've had in mind. And get The CROSSNET Effect.

Get The CROSSNET Effect.™

First Look

Digitech releases new protocol analyzer

Digitech Industries, Inc. introduced a high-speed protocol analyzer designed to cut the amount of time necessary to perform network tests.

The **Model 720** monitors, analyzes and traps network data in full-duplex mode at speeds up to 64K bit/sec. The unit is capable of decoding the frame and data packet header fields of most network protocols in real time. These headers can be displayed simultaneously with the data contained in the packet, or the user can choose to display only the combination of headers and data that is of interest.

The analyzer weighs 14 pounds when configured with an RS-232-C interface and breakout box, along with integral RS-449, V.35 or X.21 interfaces. The device also includes a remote control option, which enables users to analyze data on remote networks.

Prices start at \$6,950.

Digitech Industries, Inc., 66 Grove St., P.O. Box 547, Ridgefield, Conn. 06877, or call (203) 438-3731.

Unit enables four lines to share a 56K bit/sec line

TeleProcessing Products, Inc. introduced a device that enables up to four communications lines to share a single 56K bit/sec line.

The firm's **TP-2/435 Interface Sharing Unit** eliminates the need for multiple circuits and data service units (DSU) for each network node at a site. Used in multipoint, polled networks, the TP-2/435 enables multiple terminal controllers or multidrop circuits to link to a 56K bit/sec line. It will also enable a single 56K DSU to be shared by up to four terminals. The unit is equipped with V.35 interfaces supporting both data communications equipment and data terminal equipment.

The unit is also said to be capable of transmitting synchronous or asynchronous data at up to 1.544M bit/sec.

The TP-2/435 Interface Sharing Unit is priced at \$750.

TeleProcessing Products, Inc., 4565 E. Industrial St., Building 7K, Simi Valley, Calif. 93063, or call (805) 522-8147.

Software links Telex to IBM PCs, System/3Xs, Wang VS

FTC Communications, Inc., a subsidiary of National Gateway Telecom, Inc., introduced software that enables IBM Personal Computers, System/38, System/36 and System/34 minicomputers, and Wang Laboratories, Inc. VS minicomputers to exchange messages with Telex terminals.

The software runs on the vari-

ous systems and directs users wishing to send a message to a Telex terminal into a Telex mode. Once prepared, the message is transmitted via the Telex network to the receiver's terminal. The software receives, acknowledges and delivers incoming Telex messages, while retaining a full record of transactions.

There are three versions of the software. **Telex-Mint** for IBM System/34s and System/36s is priced at \$2,350 and for System/38s at \$3,250. **Message Handler** for IBM Personal Computers or Wang VS word processors is \$250.

FTC Communications, Inc., 1100 Princeton Park Corporate Center, Monmouth Junction, N.J. 08852, or call (201) 821-3950.

Bridge links remote Ethernet local nets

Infotron Systems Corp. introduced a network bridge that links remote Ethernet 802.3-compatible local-area networks over synchronous circuits operating at between 56K bit/sec and 2.048M bit/sec.

The firm's **LAN Span** bridge supports links between Ethernet networks supporting the IEEE 802.3 standard or Ethernet Version 2 via such point-to-point technologies as switched and leased lines, satellite links and microwave links. It also supports a variety of network protocols, including Digital Equipment Corp.'s DECnet or the Transmission Control Protocol/Internet Protocol.

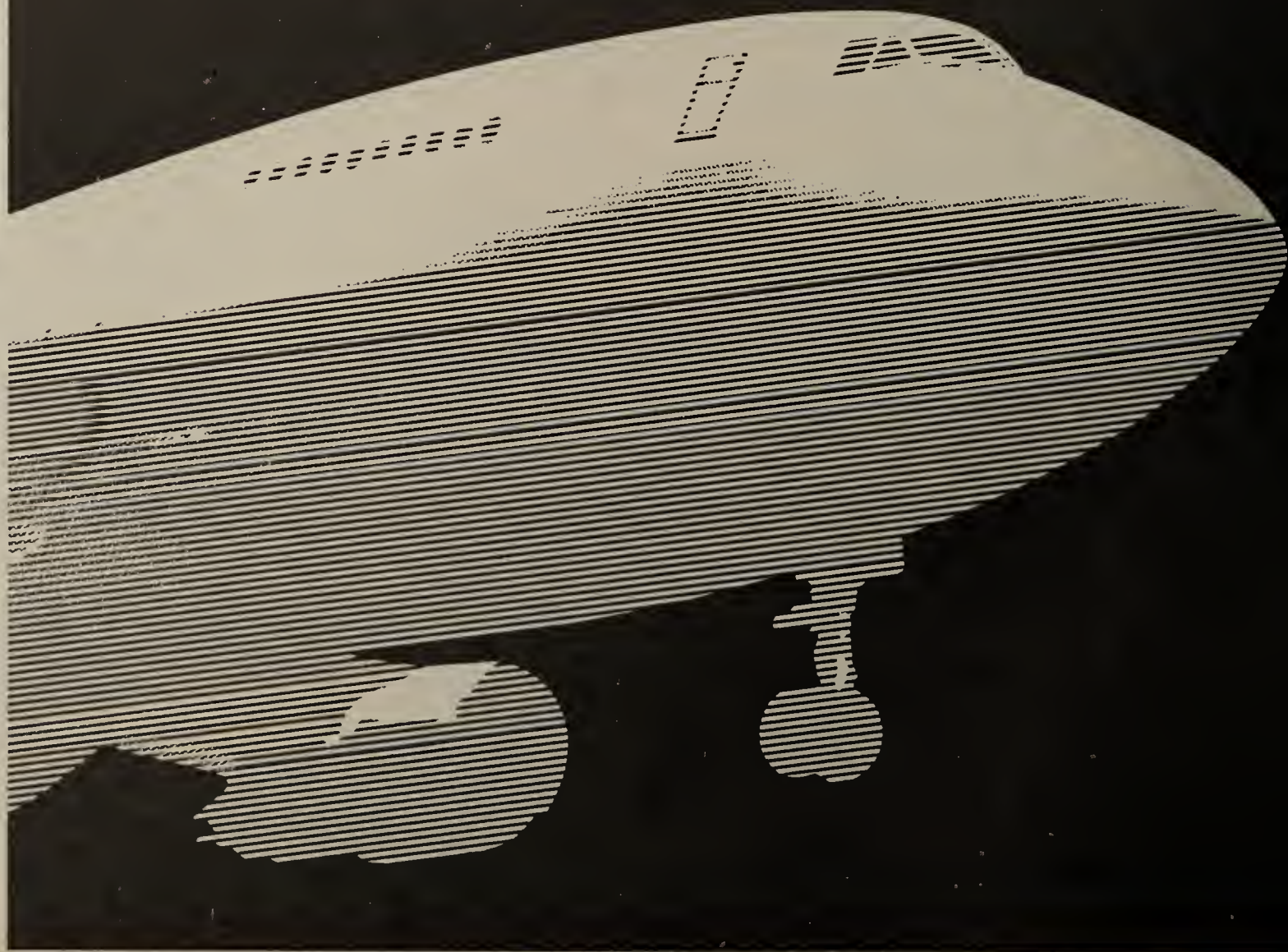
Network management functions can be performed via a terminal or IBM Personal Computer linked to LAN Span. LAN Span's menu-driven management and control software provides bridge configuration detail, Ethernet port utilization, Ethernet port statistics and wide-area link diagnostics.

LAN Span has a modular architecture and can be expanded to accommodate multiple links.

A 40M bit/sec bus architecture is used to connect the various controller, memory and processor boards. The bridge can be used stand-alone or can link to a high-speed multiplexer or networking switch.

The bridge will be available in March for \$9,995.

What our transportation clients will tell you about N.E.T.TM T1 networks:



Infotron Systems Corp., Cherry Hill Industrial Center, Cherry Hill, N.J. 08003, or call (800) 345-4636 or (609) 424-9400.

Emucom introduces X.25 PAD with integrated modem

Emucom, Inc. announced a modem featuring an integrated X.25 packet assembler/disassembler and a modem enhancer that adds PAD functions to existing modems.

The **EM-1000 Mono PAD** and **EM-2400** enable terminals, IBM Personal Computers and minicomputers to access such public X.25 packet-switching networks as Telenet Communications Corp.'s Telenet, Tymnet, McDonnell Douglas

Network Systems Co.'s Tymnet and Telecom Canada's Datapac.

The EM-2400 consists of an X.25 PAD and a modem capable of supporting synchronous and asynchronous transmission at 1,200 or 2,400 bit/sec. The EM-2400 modem component operates in full-duplex mode and is compatible with Bell 103 and 212A as well as CCITT V.22 and V.22bis standards.

The stand-alone EM-1000 Mono PAD adds X.25 PAD functions to any 1,200 or 2,400 bit/sec Hayes Microcomputer Products, Inc. AT-compatible synchronous modem.

Both products provide virtual call capabilities over leased or dial-up lines, and both support the CCITT Link Access Procedure B error-correcting protocol. In non-

X.25 environments, the Emucom products function as error-correcting modems.

The EM-1000 Mono PAD is priced at \$325, and the EM-2400 costs \$795. A board-based version of the EM-2400 capable of residing in an IBM Personal Computer lists for \$745.

Emucom, Inc., 25 Industrial Ave., Chelmsford, Mass. 01824, or call (617) 256-9871.

Gandalf introduces data-over-voice board

Gandalf Data, Inc. recently added a rack-mounted data-over-voice (DOV) board to its family of DOV products.

The **RM 3640** DOV is a single-channel board residing in Gandalf's 3000 chassis. The RM 3640 works in conjunction with Gandalf's stand-alone DOV 640 unit, which transmits voice and data over a single twisted-pair wire. Users link a data terminal or IBM Personal Computer via RS-232 and a telephone via an RJ-11 jack to a DOV 640 unit. That DOV 640 slices a twisted-pair wire's bandwidth into two channels, one that carries analog voice and one that carries digital data.

The voice and data travel over a single twisted-pair wire to the new RM 3640 board located near the telephone punch down block. The RM 3640 strips the data from the wire and passes it via RS-232 to a minicomputer or host computer port. The voice channel is passed to an in-house private branch exchange, key system or Centrex trunk.

The RM 3640 board supports full-duplex synchronous data rates ranging from 2,400 to 64K bit/sec and asynchronous data at speeds up to 19.2K bit/sec. The new board supports data transmission over distances of 2.3 miles at 64K bit/sec or 3.4 miles at 32K bit/sec.

Gandalf's 3000 chassis will accommodate up to 14 RM 3640 boards.

Each RM 3640 board costs \$295.

Gandalf Data, Inc., 1020 S. Noel Ave., Wheeling, Ill. 60090, or call (312) 459-6630.

Anderson Jacobson introduces V.32 modem

Anderson Jacobson, Inc. announced a new V.32 modem that provides full-duplex, synchronous or asynchronous operation on dial-up lines or two- or four-wire leased lines at either 9.6K or 4.8K bit/sec.

The **AJ 9631-DSA** is compatible with the CCITT V.32 standard and supports trellis-coded modulation. The modem also supports local and remote echo cancellation and is capable of satellite transmission.

Additionally, the new modem supports either Hayes Microcomputer Products, Inc.'s AT command set or the CCITT's V.25bis standard for asynchronous autodialing. The AJ 9631-DSA can be configured via front-panel switches or an attached terminal. Configuration options and a telephone autodialing directory can be stored in non-volatile memory.

The unit supports such diagnostics as standard loop-back tests and an end-to-end test. Users can select a self-test loop-back generator and compare the results against parameters stored in memory. The diagnostic tests can be initiated from the front panel in both synchronous and asynchronous applications.

Available immediately, the AJ 9631-DSA uses identical modem cards for both stand-alone and rack-mountable units. Each unit is priced at \$2,295, with quantity discounts available.

Anderson Jacobson, Inc., 521 Charcot Ave., San Jose, Calif. 95131, or call (408) 435-8520.

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Opinions

The October announcement of the IBM 9750 Business Communications System product line, and the introduction of the 9751 CBX in particular,

raises a big question for IBM's 23,000 CBX customers in the U.S. That question is, "Should I consider upgrading to the 9751?" The answer is yes, because it represents a substantial improvement for CBX users now, and the future will likely bring even more substantial improvements.

Certainly, users should understand what they need from their communications systems — both in the near term and during the next several years — in order to determine if an upgrade to the 9751 is desirable now. However, the IBM 9751 offers enough significant new technology and capabilities — particularly in the areas of increased performance, reduced environmental requirements, upward migration and enhanced reliability — for every CBX II customer to look at the benefits of an upgrade.

With the promise of continued support for the CBX II and the availability now of new applications — such as a historical reporting package for automatic call distribution, a new attendant's console and a PhoneMail enhancement for both the CBX II and the 9751 — some customers may choose to upgrade within the CBX II product line.

However, if history repeats itself in the private branch exchange industry, CBX II support in the area of product enhancements will significantly decline, in the long term. This alone — the desire to be capable of enhancing one's telecommunications system when enhancements become available — may be reason enough to consider an upgrade to the 9751.

To make a prudent decision about upgrading to the 9751 line, it's best to review the improvements of the 9751 over the CBX II. A major improvement is card density. The 9751 CBX can handle up to 2,000 lines in a single node by using new circuit cards, which support 16 voice ports and 16 data ports on a single card.

Moreover, each system is shipped with the performance capacity to support a traffic mix of up to 16% data, as a starting point, which results in a substantial cost reduction for data connections when compared with the CBX II.

In addition, up to 70% more simultaneous conversations are

Chanowski is president of Telecommunications Management Corp., a telecommunications consulting firm based in Needham, Mass.

PRO:

BY FRED CHANOWSKI
Special to Network World

possible due to the new 8-kHz internal sampling rate. This new 64K bit/sec time slot is a platform for Integrated Services Digital Network Basic

and Primary Rate access and is required for heavy data-switching applications.

While some have criticized the 9751 for lacking an ISDN interface, the new switch is more than ready, from a performance and architectural standpoint, to handle ISDN implementation. The CBX II is not.

Also, the 9751 can add capacity without having to replace major common equipment components, as is necessary in the CBX II product line. Major line-size upgrades will not require any cabinet changes. Further, the 9751's enhancements are packaged in a box that requires less power and air-conditioning.

And while, admittedly, it's not

See **Pro** next page

What's in a name? Everything, if that name is IBM. And thereby hangs the tale of IBM's 9751 CBX.

While other private branch

exchange vendors have been systematically improving their products, redesigning and testing for Integrated Services Digital Network compatibility, IBM has been busy trying to solve the massive problems of restructuring Rolm Corp. and integrating it into the IBM fold. Now IBM is ready to get back into the PBX business.

If any lesser force than IBM unveiled a product with the characteristics of the 9751, the announcement would have been greeted with boredom at best, chuckles from many and anger at worst. The 9751 is technically boring and users' worst fears of their existing equipment becoming obsolete have materialized.

The 9751's "major improvements" merely bring the CBX into

CON:

BY SHERRY GEDDES
Special to Network World

the 1980s technically. The huge, and long overdue, improvements in traffic capacity, busy-hour call attempts, power

consumption, air-conditioning requirements and size are directly attributable to IBM's decision to bite the bullet and scrap Rolm's proprietary and inefficient 12-kHz sampling rate in favor of the industry-standard 8-kHz rate.

This decision made 16-port line cards feasible, which, in turn, made it possible to reduce the physical requirements of the CBX drastically while significantly improving traffic characteristics.

The 16-port line card was pretty exciting when AT&T introduced it on the System 85 in 1985. Reducing the footprint and air-conditioning requirements of the CBX by more than 50% merely brings the behemoth down to normal size — hardly an engineering breakthrough.

Further, the "seamless" line-size growth path of the 9751 is marketing at its best, since it merely mirrors the range of line sizes offered by migrating from the VSCBX up to CBX 9000AE, the 9751's largest predecessor.

Major line-size upgrades will still require cabinet changes as well as additions, as with any other switch on the market. Further, there's nothing unusual in IBM's claim that you can use the same station equipment. It's always been interchangeable on CBXs.

In fairness to IBM, the 9751's bus, the Rolmbus 295E, is an improvement. Now, the RB295 finally meets its original specifications.

However, discussions of the RB295 by IBM at the 1985 International Communications Association conference implied that foreign exchange line support would be implemented in the bus. That improvement wasn't done.

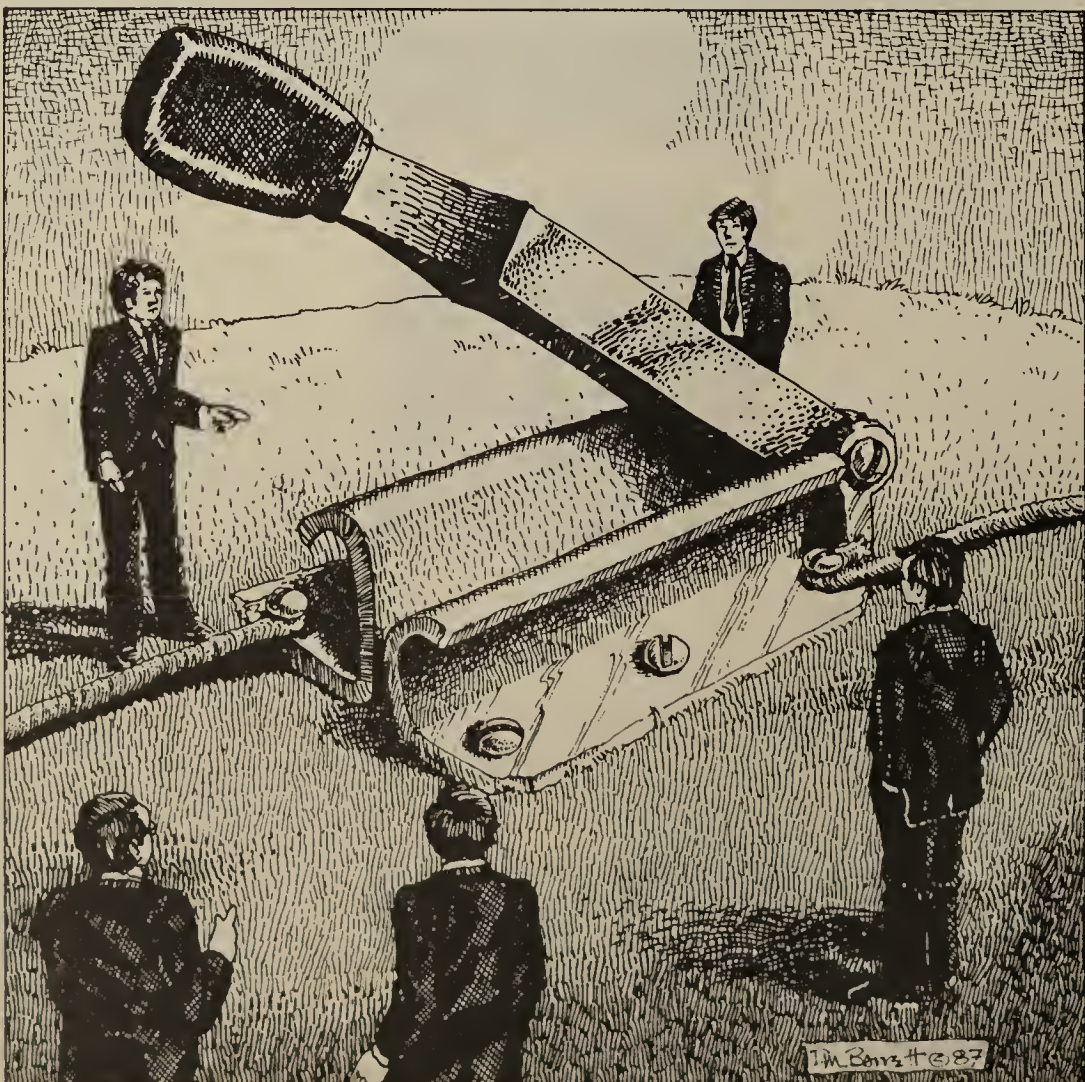
What happened to Systems Network Architecture integration, ISDN capability and the processor planned for this introduction?

Rolm was faced with four major engineering challenges:

- Develop a new processor compatible with SNA and other IBM processors.
- Modify the CBX design elements to accommodate IBM's advanced manufacturing techniques.
- Use IBM's advanced design tools for improved engineering design integrity, upgradability and ease of maintenance.
- Handle the pressing physical is-

Geddes is managing partner of telecommunications for CTPS, Inc., a communications consulting and research firm in Mountain View, Calif.

Is the IBM 9751 a substantial improvement for CBX users?



Opinions

►TELETOONS — By Phil Frank



sues such as size and busy-hour call attempts for which Rolm has been criticized.

Of these four challenges, this announcement only addresses the last one. IBM elected to evolve the CBX from the outside in — saving the control and line monitoring software while gutting shelving to improve physical characteristics.

SNA integration, ISDN capability and new processor development, all of which require major software changes, apparently exceeded IBM engineering's capabilities in the time available. This is understandable when one remembers the engineering exodus following IBM's takeover of Rolm.

IBM could have delayed this announcement until the product matched its ambitious objectives and then really made a splash, but this wasn't done. Why? Rolm has been losing market share.

The CBX 9000AE, introduced last February, had to win big in the market. By early summer, however, it was apparent the unit could not reverse the downward trend. Faced with well-publicized commitments to telecommunications,

See **Con** page 44

Pro from previous page the smallest box in the industry, the 9751 takes up significantly less space than previous models.

In view of these enhancements, any CBX II customer would benefit from an upgrade to the 9750 line at some point. Customers with one or more of the following circumstances are most likely to benefit immediately:

- Customers relocating their CBX and telephone users.
- Customers with expiring leases.
- Customers adding capacity to accommodate growth.
- Customers increasing their use of data switching substantially.
- Customers adding or increasing their use of communications applications, such as voice messaging and automatic call distribution.
- Customers preparing for ISDN.

A rule of thumb is, if you anticipate growth at or exceeding 50% of your current configuration over your system's life cycle, you'll achieve substantial benefits by migrating to the 9751 now.

Finally, an upgrade from a CBX II to the 9751 doesn't require a total replacement of every compo-

See **Pro** page 44

EDITORIAL

Vendors aren't partners

Many a vendor has sidled up to a user recently and said, "Let's be partners."

And many a user has responded, "Who do you think you're kidding?"

The buyer-seller relationship will always be best characterized by "caveat emptor" — as it should be. A true business partnership is a synergistic relationship between parties who seek to profit exclusively from proprietary strategic advantages that accrue to them both as a result of their agreement.

"Partnering" with customers seems to be a key facet of nearly every major computer and communications vendor's marketing strategy these days. Unfortunately for users, there's little or no exclusivity involved when vendors talk about partnering.

Vendors are offering similarly hyped deals to every one of their customers, while concealing their true intent, which is to use the partnering concept to blunt buyers' healthy skepticism about the deals they are offered.

Consider a hypothetical example of a truly strategic user-vendor partnership. A networking equipment vendor develops a new technology — the specific type is unimportant — that's a quantum leap beyond any current alternative.

Instead of going it alone and developing a product or service to sell to all comers, the vendor approaches a user company that owns a nationwide private network and proposes a mutually advantageous arrangement. The vendor provides the technology; the user provides the network facilities over which the product can be used.

Together, they become the sole proprietors of a revolutionary new communications service. If the vendor offers its technology to other parties, then the arrangement is no longer exclusive or strategic as far as the user is concerned.

User-vendor relationships like the one just described are the only agreements that bring real benefits to the user and, therefore, deserve to be called partnerships. But it is unlikely that such relationships will form.

While it's hoped that the vendor-user partnering concept quickly goes the way of the pet rock, there's much to be said in favor of improving user-vendor

relationships. When all the hype is stripped away from vendors' partnering talk, what remains in some cases is a genuine intent to work more closely and efficiently with customers.

What's the best way for vendors to do that? They can communicate openly with users at every step of a project, from the initial customer inquiry through the request-for-proposal process to implementation, cutover and ongoing operations and maintenance.

Users want vendors to be responsive. That means coming up with quick and accurate answers to customer questions and making sure users enjoy quick access to expert technicians. Too often, what they get instead is quick access to technically deficient marketing representatives or account team liaisons who serve only to impede the flow of information.

What can users do to help vendors be responsive? They can avoid taking up vendor technicians' time with trivial matters that can be handled by the users' own staffs. They can avoid setting unrealistically short response deadlines for RFPs or repair work.

Finally, both users and vendors can make sure they live up to the terms of their agreements. Too often, large projects are delayed or completely derailed because one party agrees to a contractual provision but doesn't live up to it.

Another problem is that contracts governing large networking projects are becoming more complex and stringent, yet high-tech contracts are often prepared by technologically ignorant lawyers.

To minimize contractual problems, both the vendor and the user should have their contracts prepared and reviewed by lawyers that specialize in high-tech legal issues.

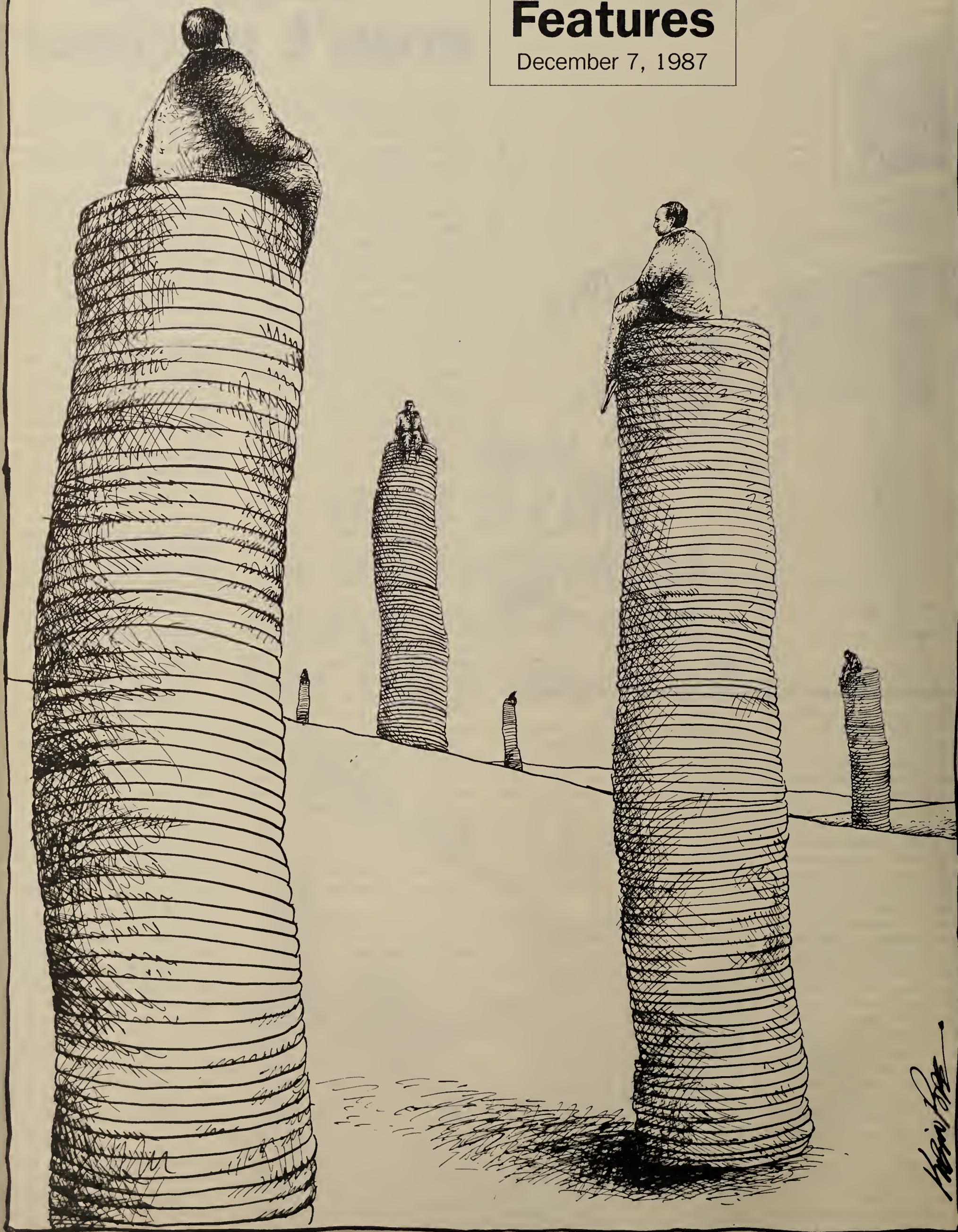
Users and vendors that work together in the ways described above don't need to pretend they're partners. They understand their roles as buyer and seller, and they need only reach a mutually satisfactory agreement.

Vendors should drop all their blather about partnering and focus on developing innovative, reliable, responsively supported products and services. Let's call a vendor a vendor. ▢

NETWORK WORLD

Features

December 7, 1987



Special Section: The communications budget

Too much bottom-line thinking

Continued from page 1

1986 to 1987, but it is well below what might be expected if companies were dramatically increasing communications spending to develop new strategic applications.

These growth figures were gleaned from *Network World's* second annual budget survey, which is based on 50 responses from the *Network World* Panel of Communications Users. The panel, a consortium of communications managers who regularly share their insights into the communications industry with *Network World*, represents the nation's largest and most sophisticated users. The 50 companies had an average revenue of \$2,926,378,000; 20 had 1987 sales of at least \$1 billion.

The average 1987 communications budget was \$9,348,040, a figure expected to grow to \$9,908,000 in 1988. The largest budget was \$122 million, and the smallest was

Here are the results from *Network World's* annual budget survey.

\$100,000. Communications budgets take up little more than 0.3% of the average corporation's revenue.

The typical 1987 staff consisted of 25 employees; the largest staff among the companies surveyed numbered 250. The average staff will grow by two employees next year, an increase required by corporate network expansion. For example, Miami's Florida Power & Light Co. is installing a new fiber-optic network and plans to add three new employees.

The way budgets are divvied up will not change significantly during 1988. Managers spent 56% of their 1987 budgets on services, such as private lines; 12% went to personnel; 12% was spent on data communications equipment; 11% went to voice equipment; 5% was allocated to maintenance; and 4% was used for miscellaneous expenses, such as travel and consulting services. Service and data equipment costs will drop by 1% next year, while personnel and miscellaneous expenses are slated to increase by 1%.

Keeping costs in line

The budget stability masks the fact that most companies' communications requirements are expected to increase by 10% or more next year. The additional requirements come from new customers these companies expect to garner as they expand their businesses. Managers are following a two-pronged approach to keep current communica-

Continued on next page

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tions costs in line.

First, cheaper line rates and new technologies, such as T-1 lines, have enabled managers to put a lid on carrier services. Alan Johnson, telecommunications manager at Peabody Holding Co. in St. Louis, says, "My budget has remained relatively stable through the last few years, even though the company's

increase relative to voice costs. Users said data expenses will rise from 34.9% of the 1987 budget to 36.3% of next year's budget, while voice expenses will drop from 65.1% to 63.7%. Charlie Snell, director of communications and computing at Harris Corp. in Melbourne, Fla., says, "Data expenses are catching up to voice expenses, and it's common to see both types

Conn., says the bank views communications as a necessary evil. Cleary's view was shared by other managers who said their jobs were merely to curb corporate expenses.

Kerry Overlan, director of telecommunications at Commonwealth Energy Co. in Cambridge, Mass., cautions that such thinking may heighten during the next year. "When the economy dictates that companies tighten their belts, the first two items corporations cut are travel and communications expenses," he says.

not allocate money to experiment with new types of technology. The amount allocated by the remaining one-third averaged less than 2% of the total budget, and only one company appropriated 10% of its budget for experimenting with new types of products or services.

Tony Haeuser, telecommunications manager at M&I Marshall & Ilsley Bank in Milwaukee, says his job entails changing top management's perception of communications. "Telecommunications has typically been viewed as a cost-cutter, but it is a vital link in providing rapid information exchange, which is key in the highly competitive banking environment," he says.

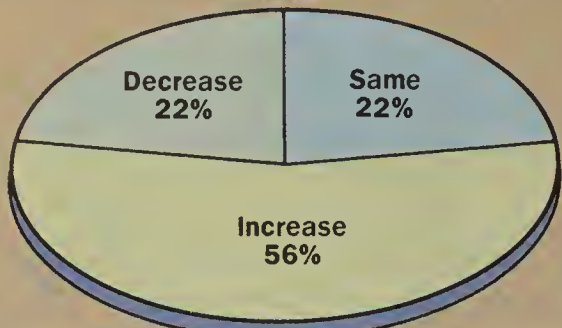
Before managers can sell upper management on the benefits of strategic applications, they must understand them themselves. Many managers listed traditional uses of communications, such as cutting costs, as strategic uses of communications.

Such functions are not considered strategic. The term strategic applies to networking applications that increase revenue or market share. The best known example is American Airlines, Inc.'s Sabre reservation network, which increased American's ticket sales by listing American flights ahead of competitors' flights.

Because the benefits of networking are not always straightforward, managers must come up with new ways of convincing top management to sponsor a strategic application. Lisa Sanford, telecommunications manager at First Tennessee Bank, N.A. in Memphis, Tenn., says, "If a project does not have a savings in hard dollars, we push it as an improvement in the

Users' budgets for 1988

Chart 1



Average revenue of company, 1987: \$2,926,378,000
Average communications budget, 1987: \$9,348,040
Percentage of revenue spent on communications, 1987: .32%
Average staff, 1987: 25
Average increase for 1988: 6%
Average budget, 1988: \$9,908,000
Average staff, 1988: 27

Based on a Network World survey of 50 communications managers.

NETWORK WORLD CHART

communications requirements have steadily risen. By installing a T-1 network, we've been able to keep our costs down."

Managers are also automating functions to keep personnel costs in line. Norman Gentry, communications manager at WSI Corp. in Bedford, Mass., is evaluating network management tools that may help keep personnel costs in line as the company expands its private-line network. "We are looking for automated troubleshooting tools

of communications using a common transport mechanism, such as a T-1 line."

Gevenie Delsol, director of corporate business communications at Levi Strauss & Co. in San Francisco, says, "Companies are relying on timely information to make key business decisions. Consequently, they are designing on-line applications and linking their data processing facilities with their customers' facilities."

Because data expenses are consuming a larger portion of the communications budget, a growing number of communications managers now report to an MIS manager. More than half of the communications managers surveyed report directly to an MIS manager. Only 10% report to general administration, which historically has overseen communications functions at many companies. Eight percent of the communications managers worked for a chief information officer.

Little management integration

Surprisingly, 30% of the respondents said they report to some other type of manager. For example, a municipal communications manager may report to a deputy mayor. Eight percent of the managers said their responsibilities were split between MIS and general administration. The split may indicate that many companies still have not decided how to integrate voice and data functions. A single manager oversees all communications functions at only 12% of the companies surveyed.

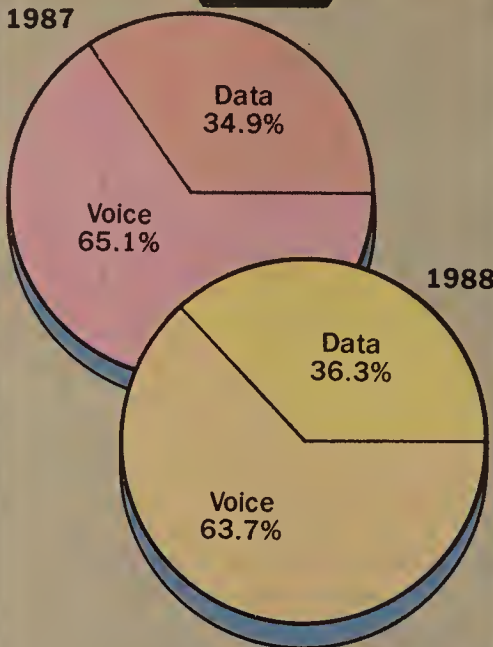
Despite all the current talk about strategic uses of communications, most companies view communications as a low-level cost-cutting function. Kevin Cleary, manager of communications and administrative services at Citytrust Bancorp., Inc. in Bridgeport,

Bottom-line thinking

The problem stems from the bottom-line thinking that most companies employ when determining department budgets. Todd Stevenson,

Breakdown of budget by voice and data expenses

Chart 2

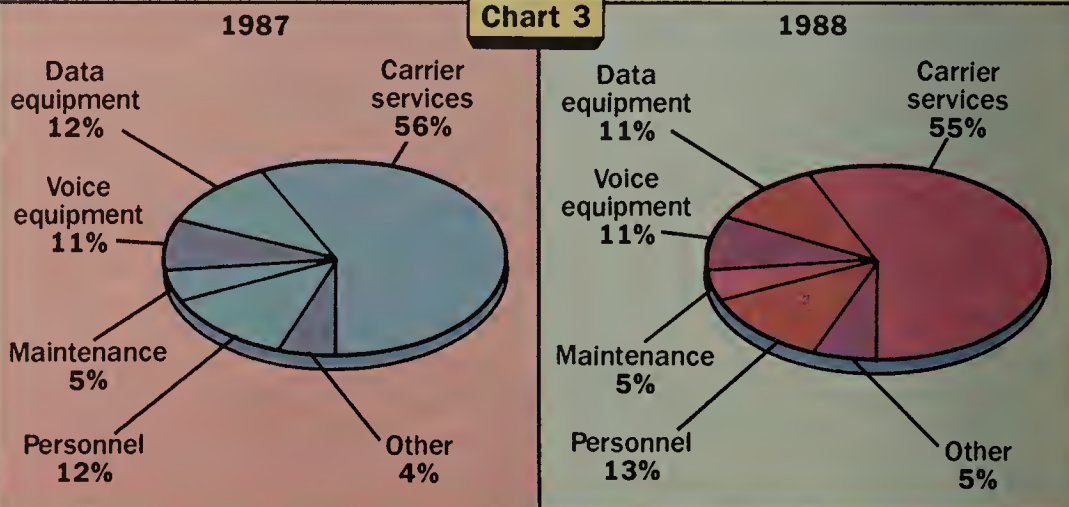


Based on a Network World survey of 50 communications managers.

NETWORK WORLD CHART

How managers allocate their budgets

Chart 3



Based on a Network World survey of 50 communications managers.

NETWORK WORLD CHART

Two-thirds of the communications managers said their companies do not allocate money to experiment with new types of technology.

that will enable us to monitor the network's health," he explains. The tools would make network operators more efficient and enable the company to expand its network without additional personnel.

During 1988, there may be a lull in equipment purchases. Since divestiture, many companies overhauled their networks and purchased new types of equipment to support them. During the next 12 months, companies plan to put the finishing touches on these networks, and few expect to make new large purchases.

Expenses for data continued to

manager of teleprocessing systems at American Transtech in Jacksonville, Fla., says all his expenses must have a tangible bottom-line benefit, either in increased revenue or decreased costs. Such thinking often handcuffs communications managers who know that a new type of equipment will help the corporation but cannot easily quantify the benefits.

Another indication of the strong bottom-line mentality is the dearth of companies willing to spend money experimenting with new technology. Close to two-thirds of the managers said their companies do

quality or reach of a service. For example, we may install additional private lines and cut the terminal response time for the customer service group."

Strategic examples

Corporations are slowly starting to understand how to leverage communications as a strategic weapon. Everett Stonebreaker, director of telecommunications at Florida Power & Light, states that upper management does not yet view communications as a strategic asset but is beginning to under-

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Thanks, ICA members, for making Network World your best-read communications-oriented publication.

NETWORK WORLD

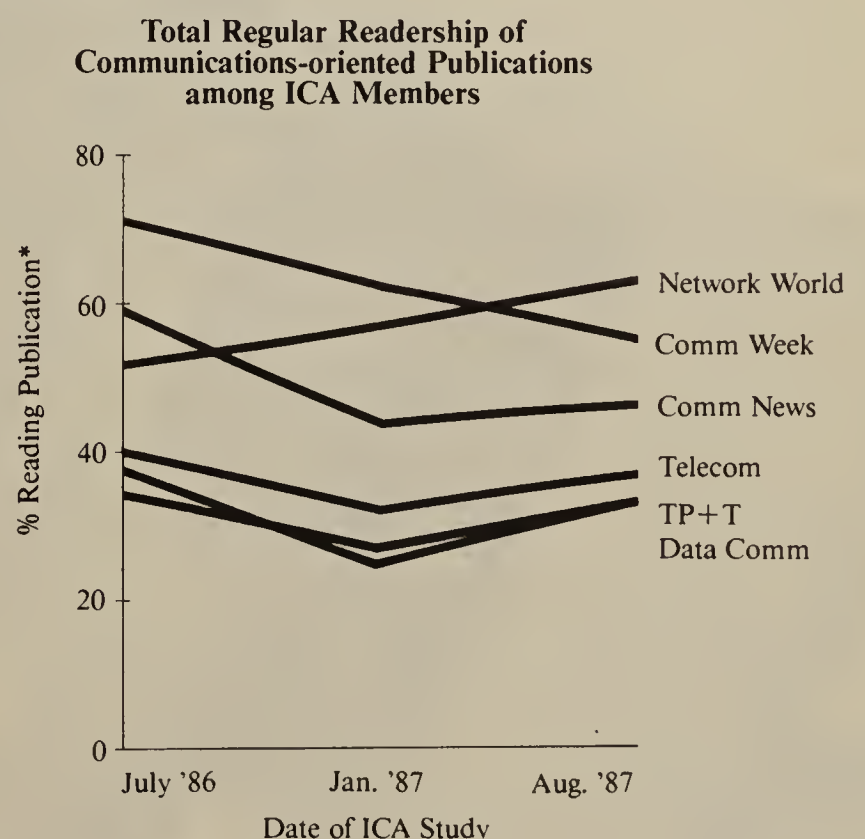
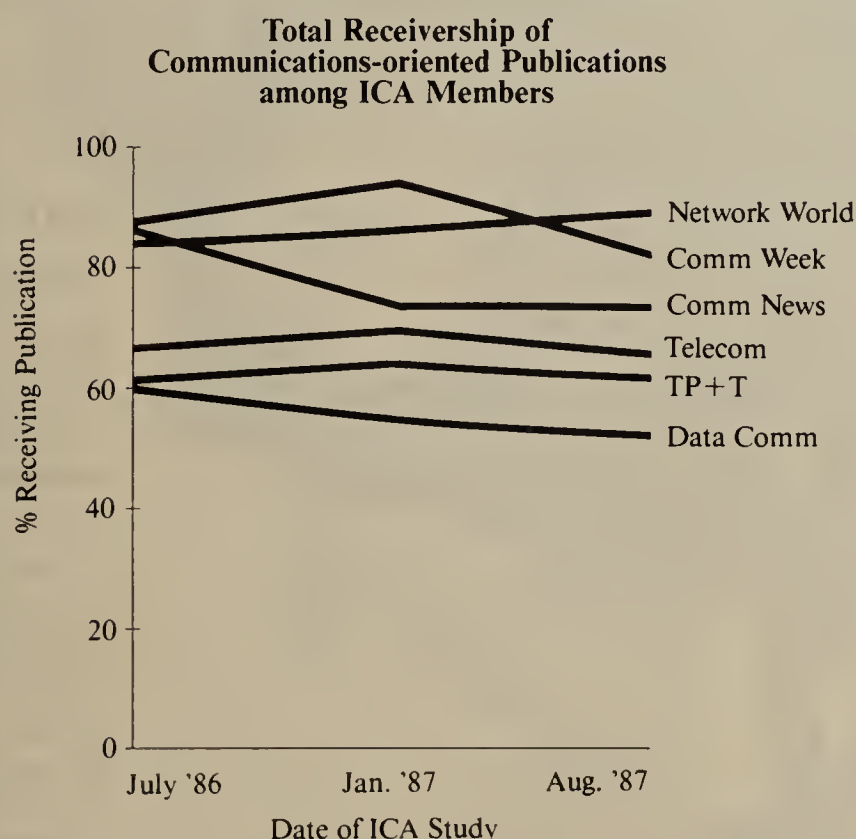
Gary J. Beach
Publisher

"Rome wasn't built in a day." Although you've heard this saying time and time again, the philosophy behind it — that through hard work you can make things better day by day, week by week, and year by year — remains sound.

It's this very philosophy that *Network World* editors have followed during the past 18 months. And in doing so, they have remained true to their initial goal: to make each issue of *Network World* the best possible for you, our readers.

Evidence is growing that *Network World's* long-term commitment to editorial excellence is paying off. In fact, the latest study conducted by an independent research firm among ICA members shows rather impressive results. Not only does *Network World* top the list of communications-oriented publications in receivership, but it now ranks number one in readership as well.

As you can see in the following charts, both receivership and readership of *Network World* among ICA members have steadily increased since July 1986. However, during this time period, these same ratings have declined for almost every other communications-oriented publication.



* Readership figure for each publication is based on the number of ICA members who receive that publication.
Studies conducted by First Market Research of Boston.

There's no question about it. *Network World's* in-depth networking coverage is what enables us to deliver a unique editorial product that progressive communications users have come to rely on week after week.

Thanks to the growing support of ICA members and continued dedication of all our readers, *Network World* is now the number one communications-oriented publication for today's leading-edge users.

Cordially,

Gary J. Beach
Publisher

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An IDG Communications Publication

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stand its potential to become such an asset. The utility is putting in a new fiber-optic network and that project has given Stonebreaker access to the top management levels in the company. This exposure is one reason the corporation is changing its view of communications.

Once a contact is made, approval for new projects

"The question is whether or not a company sees the benefits that communications can provide," notes Levi Strauss' Delsol.

becomes easier. "The question is whether or not a company sees the benefits that communications can provide, since it is often

very difficult to measure the returns," notes Levi Strauss' Delsol.

After being convinced such benefits exist, Levi

Strauss undertook an electronic data interchange project to link itself more closely with its suppliers.

"Once you make it easier

for your customers to do business with you, you will be better able to keep them as customers," Delsol says.

Other companies are developing closer links to customers. McDonnell Douglas Corp. has been using a videoconferencing network to hold corporate meetings. The project has been so successful that the company is expanding the network to its suppliers.

"Not only do we cut our own travel time, but we forge a closer link to suppliers," explains Don Augustin, director of telecommunications network services at the St. Louis-based company.

The strategic use of communications is not limited to the commercial sector. Robert Bursick, director of telecommunications at Wayne State University in Detroit, says the college is trying to use communications to increase enrollment. The university placed registration information at the local high

Levi Strauss undertook an EDI project to link itself more closely with its suppliers.

schools so that guidance counselors could easily access it on-line.

A particularly successful use of a strategic communications application was initiated by Decatur Federal Savings and Loan Association. Douglas Sappenfield, vice-president of operations at the Decatur, Ga.-based bank, says that 18 months ago the bank installed a voice-response unit.

Previously, a six-person customer service department handled 9,000 customer inquiries each month. With the voice-response unit, the number of inquiries rose to 28,000 a month.

Recently, the company added a second voice-response unit and the number of calls swelled to 48,000 a month. "We were able to use technology to keep our customers, and we didn't even have to add to our staff," he says.

Information for this report was collected by Network World staff. □



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Special Section: The communications budget

Rising to the task



The ways
and means
of successful
budget
management

BY GARY KERN
Special to Network World

Communications has become a resource for creatively and energetically developing corporate growth potential and improving profitability. But with this opportunity comes the challenge of properly planning and budgeting this resource.

Budgeting for a communications department involves considerably more than just playing with numbers. It's a complex, intricate process that requires business, technical and personnel skills. The following are 10 tips for communications managers planning departmental budgets.

Understand the business

Developing business acumen is a key element of budgeting. In essence, budgeting involves plan-

Continued on next page

Kern is a manager associated with the Management Consulting Services practice of Coopers & Lybrand in New York.

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ning, and planning necessitates knowledge of the business.

Is the company expanding, cutting back in some areas, restructuring, or has it reached a plateau? Is the company in an industry that's newly emerging, still growing or mature? What are the company's goals and objectives for 1988? How about for the next five years? These are questions managers should be asking. They're crucial to planning how resources are to be deployed in communications. Communications managers must be action-oriented instead of reactionary in their thinking.

Forge relationships

Relationships should be built on three fronts — with associates inside one's company, with vendors and with colleagues in the telecommunications field.

Developing a personal network within one's company can enhance individual knowledge of the company's activities. If, for example, one division is doing poorly, associates may be able to shed light on why, and they may also provide insight into what senior management plans to do about it. With this knowledge, managers may develop a communications-related plan that can help achieve management objectives and be able to project properly how much it's going to cost.

The communications manager should have developed relationships with vendors that are primary suppliers. This way, vendors get the opportunity to understand the customer's business objectives and budgeting parameters better, and they're better able to service the account. It gives vendors insight into what customers want to accomplish. Vendors can alert buyers to new offerings they feel can meet customer objectives. This, in turn, will help managers budget for them. Additionally, if vendors know their customers' needs, they can bring them to the attention of senior vendor management, which may speed the development of offerings that managers are awaiting and willing to pay for.

Lastly, developing a network of industry colleagues will provide an opportunity to discuss issues and problems with peers. Contacting other users who have overcome similar problems is a mutually beneficial experience; one user gains insight into an approach and cost of solving a problem — something that can be used in the budgeting process — while the other gets the satisfaction of knowing his own creativity and insight are valuable to others.

Know what you're paying for

Communications expenditures are typically the third largest expense a company faces overall. Ranking behind only real estate and personnel, communications often represents ½% to 1½% of annual sales. Another yardstick equates communications costs to 5% to 10% of selling, general and administrative expenses. Obviously, the more communications-intensive a busi-

ness is, the higher these ratios will be.

In order to manage an expense of this magnitude effectively, it must be quantified. This type of expense gathering should be top priority. Chances are that some misbillings and overbillings will be uncovered and rectified.

Next, analyze expenditures. For most companies, two expense items are relatively common: First, long-distance expenditures account for the bulk of overall costs; second, data communications costs are the fastest rising item.

Step back and scrutinize these expenses. Where do most of the calls go? Are they intracompany? Intra-local access and transport area? Are the most cost-effective routing techniques being used? Is the choice of carriers cost-effective or just convenient? If overall long-distance costs have declined, are the company's expenses following suit? Or have they gone up? If so, why? Review current call-accounting techniques — do they provide the information needed, not only to track expenses but also to project them? If not, determine what's needed to maintain better control, and budget for it.

Find out where data communications dollars are being spent. Are local-area networks being used? Are they cost-effective? Do they contribute to increased productivity, or are they in existence for other reasons? Are those reasons valid from a business perspective?

If data communications has made a significant impact on certain areas of company performance, review this with the departments that have been most affected. Find out where productivity and performance have increased, and use this information to project how data communications might be used in other areas of the company. Gain the concurrence of the other department heads, and budget for this increase. Preselling is a major aspect of budgeting.

Develop wiring standards

Wiring is pervasive. Most companies don't know how much wiring they've got and what it costs. They either can't or don't account for it, or they have the cost hidden somewhere else.

A program should be developed to control this. One approach is to identify each new cable as it's installed; likewise, as coaxial cables become disconnected, users might want to have them physically removed and placed in inventory. This will eliminate the "spaghetti" syndrome and allow reuse of cables to avoid buying new cabling the next time it's needed.

Users planning major installations might want to investigate buying cable in bulk. Also, if the lengths of individual cable runs are known, get prices for having the cable pre-cut and the connectors installed before delivery. The savings potential of this is enormous.

Cost center or profit center?

In addition to categorizing and

optimizing costs, consideration must be given to whether communications is budgeted for as a cost center or as a profit center.

With a cost center, managers need to know what aspects of communications can best serve company needs. If, for example, there are applications in emerging technologies that might prove beneficial to overall company objectives and goals, managers may want to budget some research dollars to allow further investigation and some field tests where viable. If this is the case, develop a research and development budget and build a business case for this funding.

On the other hand, if communications is considered a profit center, expenses should be kept as low as possible, and methods should be devised to recoup communications costs from various divisions in the company.

One avenue to pursue is a good cost-accounting program. Develop a standard chargeback approach for such items as equipment, long-distance usage, computer time and so on. Make a profit on each service, but keep costs competitive. Factor in the added value provided by managing services while still pricing them less than what they would cost users to get outside the company. Seek advice from colleagues in other companies that have done this, and talk to corporate financial and accounting people to get their insights.

Account for tax effects

The Tax Reform Act of 1986 had a significant impact on telecommunications equipment. According to Jim Flood, tax manager for Coopers & Lybrand, there are three main points of which the communications manager should be cognizant:

- The Investment Tax Credit (ITC) has been eliminated.
- Telecommunications equipment, for the most part, must now be depreciated over seven years instead of five.
- "Qualified technology equipment" is assigned a five-year treatment. This means that new private branch exchanges are going to be treated differently than refurbished or used ones, and key systems may be looked at in a different light than hybrid or electronic key systems. Before buying, check with company financial experts to determine which depreciation schedule should be used.

These tax changes will weigh heavily in the decision to lease or purchase telecommunications equipment. Because leasing firms could previously take advantage of the ITC, their lease rates could reflect this and be quite attractive. Now, with the ITC eliminated, leasing may not be as favorable.

Managers planning to acquire equipment next year should be familiar with the implications of leasing vs. purchasing and with the way the equipment is depreciated from both financial and operational aspects.

Develop a core organization

Just as a building needs a solid

foundation, a communications department requires a solid core team. The key to this is in the design of the department: Recognize and provide for core requirements — technical, administrative and general know-how.

The number of people in the department and the level of expertise in each area are dependent on such parameters as:

- Overall communications expense.
- Number of locations being managed.
- Future company plans, such as acquisitions.

The communications department's success is dependent upon the manager's ability to find and retain good people. To accomplish this, career paths should be developed for each discipline in the department. Good communications people today are similar to engineers in the late 1960s and computer programmers of the 1970s — they're in demand, hard to find and more apt to be loyal to the profession than to a particular company. They often jump ship when another company offers them a few dollars more. But the main reason they leave isn't always just to get the extra compensation. It may be they don't see a career path in front of them, and they go elsewhere to find one.

Try to keep good people. Be cognizant of what industry pay scales are. Find out what makes people tick and what they want from their jobs, and incorporate the implications of this in departmental budgeting. It may mean requesting extra funds for bonuses, seminars, raises and other items, but it's much less expensive than going through costly turnovers — especially those involving key people.

Proper budgeting involves the development of a department that complements company goals and objectives while providing a healthy working environment. It also involves the building of a business case to sell this package to senior management.

Assess your strengths

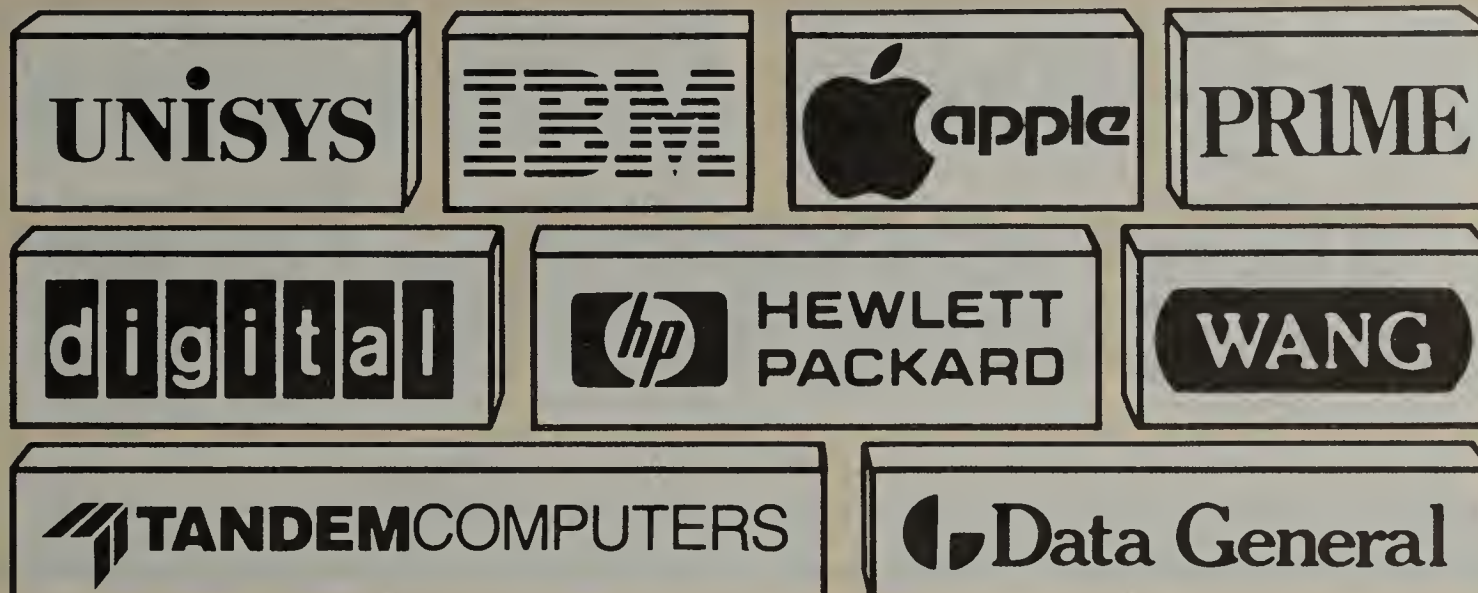
There's a delicate balance between managing and doing. Most managerial time should be concerned with the business aspect of the job, not the technical end. Technically oriented managers should surround themselves with administrative types. Conversely, business-oriented managers should be certain to allow for necessary technical support.

This introspective analysis is an important part of the budgeting process. Recognize personal strengths and weaknesses, consider the corporate goals and objectives as well as personal goals, and then budget for what will be necessary to get the job done.

Budget for outside help

All too often, communications departments try to handle all contingencies. This creates a fat staff whose productivity and usefulness is wide open for criticism in lean times. If, for example, equipment changes are planned for

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Open Systems: How open are they?

Who's most open of them all?

**BY PAM POWERS
AND STEVE MOORE**
Network World staff

The route to multivendor connectivity is liberally strewn with problems for users, primarily because computer system vendors' ideas of what constitutes openness vary so widely.

Network World's analyses of nine major vendors' systems over the past few months indicate that Hewlett-Packard Co. leads the pack in terms of current, overall support of Open Systems Interconnect (OSI) standards. Indeed, having been the first computer maker to abandon its proprietary architecture in favor of the emerging

OSI protocol stack, HP is betting its future on standards.

The current leader in terms of IBM connectivity, however, is Data General Corp., a company that lags behind HP in fully embracing OSI. Apple Computer, Inc., in turn, excels in cooperating with third-party software vendors.

Nearly every computer vendor has staked out a connectivity niche, however narrow, in which it can claim superiority. Therefore, it's difficult — and perhaps pointless — to determine which vendor is the most open in a universal sense. It's up to users to find out which networking applications call for a particular vendor's unique brand of openness.

In the skeptical view of Dale Kutnick, an executive vice-president with Stamford, Conn.-based Gartner Group, Inc., "No one is good at multivendor connectivity today. If I had to pick, I would say that, in a year, HP would be the vendor to watch. HP, more than the others, is making moves toward openness and standards, and it's backing those moves with money."

In assessing the relative openness of a computer system environment, it's necessary to answer several key questions. To how many competing systems does the vendor offer connectivity, and at what level is that connectivity provided?

Continued on next page



From previous page

Does the vendor also support third-party efforts to link its systems to those of competitors? Finally, does the vendor provide users with a smooth and relatively inexpensive migration path toward full support of OSI standards?

Interim solutions

While all major computer vendors profess to support the seven-layer OSI communications architecture, none can support it fully today. This is because key protocols at Layers 3, 6 and 7 are still one to two years away from becoming fully approved international standards.

In the meantime, vendors must either implement a "pseudo-OSI" architecture by making guesses as to the final form of the unfinished protocols or use an interim architecture, such as Transmission Control Protocol/Internet Protocol.

TCP/IP is, without doubt, the most popular interim architecture. It's the basis for many third-party connectivity products and is supported in one form or another by all major vendors except Tandem Computers, Inc. and Wang Laboratories, Inc., both of which intend to offer TCP/IP products in the future. Digital Equipment Corp. supports TCP/IP under Ultrix, the DEC version of Unix, but not under the VAX VMS operating system.

"In the next few years, OSI connectivity will be confined to the lower layers," says Dave Terrie, president of NewPort Consulting, a computer and communications consulting firm in Scituate, Mass. "What you really need today in the multivendor environment is TCP/IP. There's a lot of stuff to market with OSI, but users can't use it. If the vendor is using TCP/IP, the user can expect to be able to plug into about 100 different vendors with some degree of interoperability."

On the strength of its large installed base of proprietary Systems Network Architecture networks, IBM is the only vendor in a position to downplay TCP/IP, drag its feet on OSI and depend on other vendors to develop high-level links directly into its systems environment. All vendors discussed in *Network World's* Open Systems series have invested heavily in providing links to Big Blue's systems.

DEC's rapid growth may soon put it in a position similar to that of IBM. HP, with a product called Network Services for the DEC VAX Computer, has already moved to provide sophisticated DEC-specific connectivity. The burgeoning third-party DEC connectivity market will no doubt induce other systems vendors to follow HP's lead and develop their own high-level DEC links.

Beyond connections to IBM and DEC, however, computer vendors prefer not to provide high-level links to competitors' systems. Users with diverse multivendor environments wanting more than basic terminal emulation and protocol conversion must either develop such links themselves or seek out connectivity products offered by

third-party vendors.

Assessing IBM connectivity

Industry experts differ in their assessments of vendors' IBM connectivity. Terrie calls the IBM connectivity game a two-horse race between DG and Wang. HP is nipping at their heels, and DEC lags behind HP, he says.

"Those four vendors all have upper level gateways connecting to IBM. DEC makes a lot of noise; but in key areas, it hasn't delivered. DEC lacks both [Professional Office Systems] and full-function [Systems Network Architecture Distribution Services] support," Terrie says.

Another important aspect of IBM connectivity, Terrie emphasizes, is the ability to piggyback on SNA, which he says DG does well. DG allows users to implement SNA transport protocols as a substitute for DG transport protocols. DG data is sent across the network as if it were SNA data and is then unwrapped and presented to the DG machine. Terrie explains that this method obviates the need for separate lines for DG and other traffic. "DEC is saying it doesn't need SNA, although I think it would help them strategically to support it," Terrie concludes.

Mike Braude, a corporate vice-president at Gartner Group, ranks Tandem No. 1 in IBM connectivity. "The only requirement they haven't met yet is for cooperative processing between their machines and IBM's," he says.

Tandem's SNA Access Services Software (SNAX) products support a wide variety of IBM protocols, including LU 0 through 4, as well as LU 6.2. Tandem also offers a direct, high-speed channel attachment between its systems and SNA hosts. However, the company does not yet support PU 2.1 or SNADS.

DEC again trails the competition in the eyes of John McCarthy, director of the Professional Automation Report with Forrester Research, Inc. in Cambridge, Mass. He gives DG, Wang, Tandem and HP high marks, noting that DG is the only vendor among them to support PU 2.1 today. "DEC is a layer below those four, because it has no PROFS for All-In-1, unless you go to a third party," he says.

"Wang is moving very aggressively with its Professional Application Creation Environment (PACE) connection products, which will hook up high-level IBM data bases. Ultimately, I think that product will be very important," McCarthy adds.

But while Terrie and McCarthy denigrate DEC's IBM connectivity, a third expert says he finds DEC superior to its competitors. Thomas J. Routt, president of Network Systems Consulting in Seattle, says, "Clearly, PROFS is important, but DISOSS is IBM's flagship office automation implementation product at this time. Out of these vendors [in *Network World's* Open Systems series], DEC is the most aligned to IBM's SNA through gateways. DEC has DEC-SNA gateways, which provide users with a number of advantages. The compa-

ny supports LU 6.2 and [Document Interchange Architecture], SNA LU 1, 2 and 3 emulation to the IBM world, VAX application access into IBM DISOSS applications and IBM 3270 access to VAX applications."

Third-party vendor support

During the long journey down the open road, vendors can make multivendor connectivity easier by providing third parties with product specifications that facilitate the development of bridging products. This can be accomplished by licensing source code, publishing specifications or providing programming interfaces to third-party software vendors. However, while some vendors provide source code to customers under limited circumstances, they're loath to share it with third parties.

Application program interfaces may be more in evidence, but "there's a world of difference between publishing interfaces and licensing code," Terrie says. "IBM publishes a lot of interfaces, but it takes people quite a while to figure out how to use them. IBM will always make sure it hits the availability window first."

Routt defends IBM's cooperation with third-party vendors. "IBM has published application program interfaces for its SNA architecture, LU 6.2, Node Type 2.1, SNADS, DIA and Distributed Data Management and Management Services Architecture. Anyone with those specifications is in a position to develop products around them."

Apple outshines IBM and the rest of the field when it comes to cooperation with third-party vendors. This comes as no surprise, since any maker of non-IBM-compatible personal computers must nurture a thriving community of third-party software developers.

John Neumann, a senior vice-president with Vienna, Va.-based Omnicom, Inc., says he thinks the most that can be expected from any vendor is that it publish its interfaces. Omnicom is a developer of OSI software, and Neumann says that, in his experience, all vendors are interested in participating in OSI development.

"We have tested our OSI software only with DEC and IBM in Europe, but my sense is that all the vendors are working closely with each other to achieve interoperability," he said.

Migration to OSI

What OSI compatibility means today, and what purpose it serves today, are highly debatable. While vendor OSI-based products will enable disparate systems to communicate, those communications will never take place in a manner as sophisticated as communications in a single vendor's systems environment. And vendors will still attempt to distinguish themselves by developing proprietary applications with greater functionality than can be obtained through the OSI architecture.

Therefore, users hoping to communicate at high levels between disparate systems without losing anything in the translation are

doomed to disappointment.

"You want vendors to keep building proprietary applications," McCarthy observes. "Those are controlled by one vendor, which means they'll evolve a lot faster for general use than a standard that has to be thrashed out by 30 companies in a standards body."

Still, OSI-based connectivity products will be invaluable to users who must integrate multivendor networks. Despite DEC's advertisements to the contrary, no single vendor will ever have it all. OSI gateways look like the best solution for users whose applications dictate a multivendor networking approach.

The premier vendor in terms of OSI compatibility today, HP, has phased out its proprietary architecture in favor of a completely OSI-based solution. Where international standards are undefined, HP has implemented de facto standards, such as TCP/IP, as interim measures. Migrating to OSI was a matter of survival for HP, which lacks the resources to pursue proprietary connections to both IBM and DEC environments.

HP isn't the only vendor pushing OSI solutions, however. Network Systems Consulting's Routt puts DEC and, surprisingly, IBM at the top of his OSI-compatibility list. "DEC probably tops the list with its [Digital Network Architecture] Phase 5 implementations. It was the first company to state a strategic alignment in its future products to OSI. But IBM has done a lot in that area as well. Until two years ago, that wouldn't have been true, but since then IBM has introduced 21 separate OSI products that range in support from X.400 to [File Transfer and Access Method] to [Manufacturing Automation Protocol]."

While all nine vendors surveyed by *Network World* have stated their intent to support the X.400 electronic messaging standard, only three vendors have products available now. DEC is the only vendor with an X.400 product available in the U.S.; HP's and IBM's similar products are offered in Europe only.

X.400 is actually a CCITT standard, but International Standards Organization technical committees have endorsed it, suggesting that it will become part of the OSI stack. Routt anticipates IBM's peer-to-peer communications protocol, LU 6.2, will meet the same fate. "IBM has been defeated a few times in attempts to make LU 6.2 a Layer 6 and 7 standard," Routt says, "but I think it'll be successful with the third attempt." LU 6.2, he says, is a superior general-purpose inter-program protocol.

But while IBM proclaims OSI support and is participating in the standards-making process, only in Europe has it introduced products that conform to all seven layers of the OSI reference model. Currently, it sells products that conform only to the model's lower three layers in the U.S. IBM says domestic demand for OSI is lacking; it has no plans to introduce its

Continued on page 44

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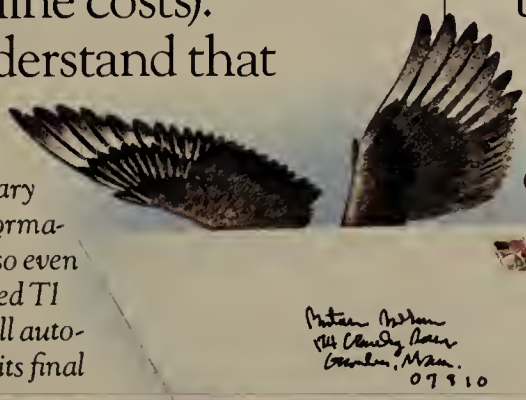
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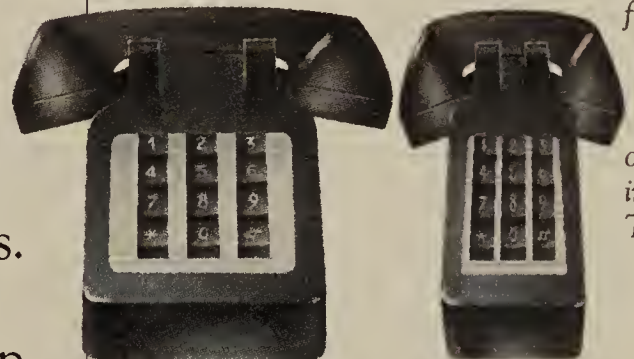
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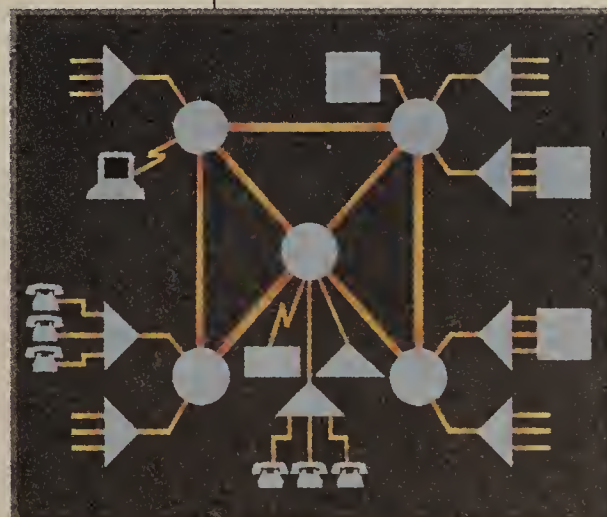
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Who's most open of them all?

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other products in the U.S. soon.

Current OSI problems

There are still other elements to be reckoned with in the OSI equation. Omnicom's Neumann points out that the industry still has to wrestle with interface specifications, which are nonexistent today, before interoperability can be achieved at the application level. "My interface at the top is different from [OSI software vendor] Retix's, DEC's, Tandem's and everyone else's. There won't be any communication among applications until we establish interface specifications," Neumann says; he does not expect that to happen soon.

Terrie sees another wrench in the OSI works. He says that consensus standards, which are generally agreed on outside of international standards bodies, factor heavily into future connectivity solutions. Examples include Sun Microsystems, Inc.'s Open Networking Environment, which includes the Network File System file-sharing protocol, Apollo Computer, Inc.'s Network Computing Forum and, of course, TCP/IP.

"The consensus standards movement says we agree we can address this need with this product, and we'll all implement it, and boom, it's done. To some degree, I think consensus standards will obviate some of the need for OSI protocols, because such standards will offer much better functionality," Terrie says.

"At the same time, consensus standards are being developed with an eye toward enabling mi-

gration to OSI when OSI becomes fully functional."

Who foots the bill?

There's still a gap between communications architectures today and OSI, and someone has to pay for the transition. Vendors, of course, are fronting the substantial research and development costs associated with the transition from a closed, proprietary architecture to one supporting OSI. So some vendors find it unreasonable, even absurd, to suggest they also shoulder the cost of providing upgrades to migrate their user bases to OSI.

As far as one Wang representative is concerned, "It is the user's decision to upgrade [to OSI], so the user pays for that." A Tandem spokesman says that whether or not it charges for OSI upgrades will vary on a case-by-case basis.

Joanne Womboldt, Prime Computer, Inc.'s senior manager of communications systems marketing, states that much of the same hardware will be usable as customers upgrade to OSI compatibility, but users will be charged for completely new software necessary to migrate to OSI. "Once customers have an OSI stack, they'll get upgrades to it free as part of their maintenance contract."

Steve Wendler, DEC's marketing manager for DECnet/OSI, says DEC's customer base won't be charged for most changes along the migration path. "DECnet Phase 5 customers will migrate without charge. That's at OSI Layers 1 through 4, which is what we're integrating into DECnet/OSI Phase 5," he says. "For OSI-based applications, users might have to pay an additional license fee for applications like FTAM, but it would be a fairly nominal charge. OSI Layers

5, 6 and 7 will probably be packaged as separate products. We may also bundle Layers 5, 6 and 7 into Phase 5 products, but we haven't made a final decision on that yet."

When one captures a glimpse of the real OSI world, it isn't quite the utopia it's been cracked up to be. But, in the end, Routt observes, the purpose of OSI is not "to define how native applications within each vendor's system should behave, but to evolve toward a position where there exists a common reference for multiple heterogeneous vendors to support communications between their real appli-

cations. The true objective behind OSI is to reduce the number of interconnection options to the smallest possible number."

As vendors continue to differentiate themselves, full interoperability at the highest layers of OSI will continue to be elusive. OSI can provide basic connectivity among diverse computing environments. And, while establishing these lowest common denominators is less than ideal, it should make life easier for users with multivendor nets.

This article concludes Network World's Open System series. 

Rising to the task

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next year and managers aren't quite sure of all the tax ramifications, they may want to budget for outside professional help.

The cost of an expert in this area will eliminate guesswork and ensure that a sound financial decision is made.

Likewise, if department staff is weak in some areas, it may be more cost-effective to use outside resources than to hire additional personnel.

When to go outside

A good rule of thumb to follow regarding the use of consultants and outside personnel is to use them:

- When personal expertise is lacking.
- When operating on a deadline that department staff can't meet.
- If the cost of using outside help is determined to be less than the cost

of doing the job in-house.

Be focused

Those who succeed in communications are those who have the ability to rise above day-to-day concerns and can blend technical skills with an ability to solve large-scale business problems.

Realistically, all company budgeting is built on the corporate goals set by executive management — the chief executive officer, chief operating officer and chief financial officer. So learn to think in their terminologies. The emergence of the chief information officer as an executive position will depend largely on communications department managers' ability to promote the use of information as a resource that is as important as — if not more important than — those already deemed to be crucial to the company.

Proper budgeting and focused planning should be any manager's top priorities. 

Pro

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nent in a CBX II system. If you decide to upgrade to get the new technology and capabilities, you need to swap only the CBX II box itself.

While some may complain this represents a "forklift" upgrade, the CBX controller usually is only 30% to 40% of the total communications system investment. Telephones, other desktop devices, all wiring and all application software remain usable. These components are critical, as they represent a significant cost and affect whether or not retraining of telephone users is necessary.

Those who characterize the 9751 as a disappointment are shortsighted. They aren't considering that there will be a 9752, 9753, 9754 and so on through software enhancements to the 9751. These won't be available on the CBX II. The features and applications some expected in the 9751 will likely surface as enhancements in the future.

Along with special pricing incentives for CBX II 8000 and 9000 customers with systems installed since January 1986 and with plans to install a 9750 series CBX in the next two years, an upgrade to the 9751 may be an attractive deal — and worth consideration. 

Con

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standards and cross-system compatibility on the one hand and a rapidly eroding situation on the other, IBM fell back on a time-tested strategy: market overhang.

The 9751 CBX is classic IBM marketing: Change the name, release as much of the new product as possible and promise the rest. Promises include SNA integration, ISDN capability and a new processor. This market overhang strategy depends on the IBM name to be successful.

The unfortunate result is that the heart of the new CBX — an SNA-compatible processor and new software — is missing. The 9751 is a new CBX in name and cabinets only. IBM hopes its name and promises will keep its opportunities alive in the face of stiff competition and buy the time needed to turn the 9751 skeleton into an exciting, competitive product.

Melding Rolm's support into IBM's operation sweetens the deal for many wavering prospective buyers. So does the price, typically \$500 to \$800 per line without data.

Is the IBM name enough? Non-IBM shops aren't going to wait around. True-Blue shops probably will. If history repeats itself, IBM has bought eight to 12 months of badly needed development time. 

Letters:

Editor:

A recent article, "Attempts don't count" (NW, Oct. 12), has caused concern from our viewpoint.

In the article, it is stated that the [Northern Telecom, Inc.] Meridian SL-1XT is a medium-range private branch exchange with a busy-hour call attempts (BHCA) rating of 28,000, a busy-hour calls completion (BHCC) rating of 26,000 and a full-feature call BHCC rating of 6,000. During the interview with the author, John Hunter, we stated that the BHCA rating was 28,000 and that the BHCC rating was identical. We disagreed with the premise upon which the full-feature BHCC computation was based and did not supply a BHCC figure. However, during the course of the conversation, we did supply a BHCA rating of 6,000 for our smallest system, the Meridian SL-1ST. Thus, the article mixes apples and oranges.

It is also interesting to note that the article compares the high-end PBXs of other vendors

with the Meridian SL-1 (up to 5,000 lines). A similar comparison between the Meridian SL-1XT and the [AT&T] System 25 or [Rolm Corp.] Redwood would make us look pretty good.

Paul L. Morrison
Regional manager, public affairs
Northern Telecom, Inc.

My column wasn't intended to compare the power of AT&T, Rolm and Northern Telecom PBXs but rather to show that, whether the PBX is a high-, medium- or low-end unit, BHCA's aren't always a good measure of performance. To show that a product comparison wasn't being done, I pointed out that the AT&T and Rolm units are high-end, while the Northern Telecom SL-1 XT is a medium-range machine.

Morrison is correct when he says the SL-1 XT's 28,000 BHCA's are identical to its BHCC's, and I regret this error.

— John Hunter

Letters may be edited for space and clarity.

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With an emphasis on technical leadership, you will be responsible for software development projects involving minicomputer and microprocessor based military electronic or computer application systems.

Qualified applicants will need either a BSCS, BSEE or other technical degree and at least 8 years of experience in the design and implementation of real-time systems. You must also have a proven ability to deal with customers and perform requirements analysis/definition, project costing, scheduling and staffing. Hands on experience with state-of-the-art operating systems and higher-order languages like Ada (TM), Pascal and C is required.

SYSTEMS ENGINEERS

Providing technical leadership on projects, you will be responsible for the software development of various major military electronic systems.

To qualify, you will need either a BSCS, BSEE or other technical degree and at least 8 years of experience in hardware/software development. Previous project management experience with minicomputer and microprocessor systems development is also required.

SOFTWARE DESIGNERS

Opportunities are available as described below. To qualify the general requirements include either a BSCS or BSEE and a minimum of 4 years' experience with higher order languages PASCAL, C or Ada (TM).

MICROPROCESSOR BASED APPLICATIONS:

You will be involved with assembly and higher order language development for VAX, Intel 8080/8086, MC 68000, LSI 11/23 and/or PDP-11 processors.

ADA/ADA PDL:

The successful software candidate will design, utilizing techniques/standards like Petrinets/DoD-STD-2167, MIL-STD-CAIS, related KIT activities and development support of Ada tools.

DATA BASE MANAGEMENT:

This position involves distributed data bases across network nodes, data base machines, flow concepts and modern relational data base management systems like INGRES.

AUTOMATED TEST EQUIPMENT APPLICATIONS DEVELOPMENT:

You will be involved in test set executives/program sets, microprocessor controlled interfaces and hardware simulation tools. Previous PDP-11, RSX-11 experience a plus.

GRAPHICS APPLICATIONS:

The successful candidate will work with Raster Graphics, Windowing Systems, CAD/CAM graphics, GKS, Phigs and GCI. Previous experience with avionics packages, display graphics processors and operator interfaces is preferred.

COUNTERMEASURE APPLICATIONS:

You will identify, define and develop reconfigurability requirements and provide analysis/design for EW countermeasure systems, including local executive operating systems, kernels for multiple microprocessors, data base maintenance and reprogramming applications.

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You must be willing to travel, but you don't have to relocate.

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The Commonwealth of Massachusetts Office of Management Information Systems (OMIS) is meeting the challenge of information processing for state agencies through strategic planning, innovation, and our rapidly growing state-of-the-art technical environment which currently consists of two mainframes (a NAS XL-90 and an IBM 3081K) running MVS/XA, CICS, ADABAS/NATURAL, VTAM/NCP as well as other sophisticated software development tools and methodologies.

We are currently looking for a **Director, Technical Support** who is ready to lead a technically sophisticated group of approximately 20 software systems programmers and project leaders. You should have a minimum of 10 years' experience in Software Systems Programming with at least 3 years in a management role. The ideal candidate will have managed in a multi-CPU environment, and have solid experience with MVS/XA, DASD Management, CICS, and Performance Measurement/Capacity Planning.

The Massachusetts Technical Pay Law (TPL) enables OMIS to offer a highly competitive salary program to Data Processing professionals. Additionally, our comprehensive benefits package and our excellent training programs offer many opportunities for continuing career growth.

For consideration, please forward your resume with cover letter stating your qualifications and salary requirements to: Bob Lippman, OMIS Office of Administration, One Ashburton Place, Room 411, Box CWTSU, Boston, MA 02108.



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Clarkson University is seeking an individual with experience in supporting the UNIX environment. The successful applicant will provide general assistance in the operation of campus UNIX environments and will have principal responsibility for UNIX operations in a campus sub-network containing an Alliant FX8 minisupercomputer, a SUN Microsystems server and workstations, and enhanced microcomputers. Duties associated with the support of this environment include: managing of UNIX systems; assisting faculty and students in their use of facilities through consultation, development and presentation of short courses and seminars; preparation of printed and on-line documentation; and assistance with acquisition, installation and maintenance of academic software packages.

The applicant must possess good communications skills and the ability to work with faculty and students. Required experience includes UNIX systems generation, administration, and maintenance. A B.S. degree in a field of Science or Engineering is preferred.

Salary will be commensurate with qualifications and experience. Clarkson offers an excellent benefits package and employees are able to enter Bachelor, Master and Doctoral degree programs. Send resume, salary requirement and three references by December 23, 1987, to Robert C. Barringer, Assistant Director, Educational Resources Center, Clarkson University, Potsdam, New York, 13676.

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Three tenure-track positions available in the area of telecommunications. Ph.D. preferred; however, for one of the positions an MSEE or BSEE plus MBA with considerable telecommunications related industrial experience will be considered. A strong interest in teaching and the ability to initiate and conduct funded research programs are desired. Rank and salary commensurate with background and experience. Applications will be accepted until January 1, 1988 or until the positions are filled. To apply, send a letter of interest, a resume and the names of three references to:

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You'll be working in an IBM 4381 environment utilizing VM/VSE and CICS for application in retailing and distribution. Excellent leadership and communication skills are a must.

Ethan Allen offers you an excellent salary and benefits package, and a progressive environment where you'll find all the support you need to succeed. For confidential consideration, please send your resume and salary history to: Personnel Department, Ethan Allen, Inc., Dept. CPW, Ethan Allen Drive, Danbury, CT 06811. An Equal Opportunity Employer.

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SYSTEMS PROGRAMMERS

Our corporate data system consists of large IBM 3084 and 3090 mainframes utilizing MVS/XA, JES2, TSO/SPF, ACF/NCP, ACF/VTAM and IMS DB/DC in an SNA environment. We also employ a 4341 with VM/CMS. We have 2 positions available for the following:

- A minimum of 1-2 yrs. direct systems programming experience supporting VM/SP, VM/HPO or VM/XA SF including system maintenance and problem resolution is required. Experience with RSCS, PROFS, RACF, ACF/VTAM is also beneficial.
- ACF/VTAM and ACF/NCP including network definition, route planning, CNM product installation (NCCF,NPDA,TAF) and trace analysis.

All require experience with system maintenance using SMP/E, problem determination and resolution, assembler language coding, system generation and dump analysis.

Send resume to: David Bentler, ARIZONA PUBLIC SERVICE COMPANY, Dept. CW1130, P.O. Box 53999, Station 1102, Phoenix, AZ 85072-3999. EOE. No agencies please.

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Anticipated 12 month appointment. The Center for Governmental Studies presently manages a PC network which includes over 170 personal computers and over 50 printers distributed throughout the College of Liberal Arts and Sciences. The individual selected for this position will: (1) have significant management responsibility for the entire network; (2) oversee applications development relating to PCs and an HP3000-48 mainframe; (3) assist users with PC acquisition and software testing; (4) assist with the maintenance of existing equipment; (5) participate in the design and delivery of user training; (6) provide consulting support to system users on hardware and software problems; (7) prepare a monthly user newsletter; and (8) coordinate activities with other on-campus computing operations. Although this is a full-time position, the benefit package provides the opportunity for advanced study at no cost.

Requirements: Completed masters degree. Evidence of strong organizational/administrative abilities. Extensive experience with at least one programming language (Fortran/Pascal preferred). Knowledge of SAS and/or SPSS is desirable. Some knowledge of PC hardware. Extensive experience with MS-DOS. Experience with wordprocessing, PC database, PC graphics and PC communications software. Knowledge of Desktop publishing software is desirable. Applicants must have excellent oral and written communications skills, an ability to teach hardware and software utilization to non-technical audiences, and an ability to work patiently with inexperienced users. Experience in an educational setting and knowledge of Hewlett Packard equipment are desirable, but not essential.

Send resume, three letters of recommendation, and sample of writing to Dr. Douglas Dobson, Director, Center for Governmental Studies, Northern Illinois University, DeKalb, IL 60115. Application must be received no later than January 8, 1988.

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Codex has been identified, along with DEC and AT&T as the heavy hitters in Network Management Systems. Making connections in multi-vendor network environments is what Codex does best. And Codex has been doing it longer than any other independent network vendor. Our recently announced high-end network management system will control our modems and multiplexers, eliminating the need for different network management systems to control different types of Codex equipment. Today Codex offers the widest selection of independent compatible networking products and solutions on the market.

If you have experience in either of the above areas we would like to talk to you about openings in:

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Contact us any weekday at (617) 364-2000, ext. 2934, or rush your resume to Codex Corporation, Advanced Sourcing Group, Dept. NW 1207, 20 Cabot Blvd. MS4-70, Mansfield, MA 02048, and we will contact you. An Equal Opportunity/Affirmative Action Employer M/F/V/H.

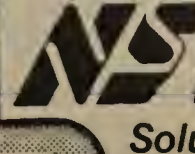
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NETWORK ENGINEER ACADEMIC COMPUTING CENTER

Clarkson University is seeking an individual to help plan, install and support campus-wide computer network facilities, including interfaces to regional and national networks. Clarkson's network is based on TCP/IP and DECNET, using Ethernet sub-networks, a broadband and fiber-optic campus backbone, and related hw/sw: IP routers and routing software, bridges, terminal servers, etc. The Clarkson network is connected to NYSENet/NSFnet, MILNET, and BITNET. Computing resources on campus presently include: an Alliant FX/8 mini-supercomputer, a Gould PowerNode 9080, and SUN workstations, all running UNIX; VAXen running VMS; an IBM 4341 running VM/CMS; and high-end Zenith PC's for all faculty and students. A Network Systems Engineer is a member of the Academic Computing Services group of the Educational Resources Center, and in addition to supporting the university backbone network assists individual academic departments in planning, installing, monitoring and supporting school/department sub-networks.

The applicant must have good verbal and written communications skills. Experience with data communication networking in a highly diversified university computing environment is required. A B.S. degree in a field of Science or Engineering is preferred.

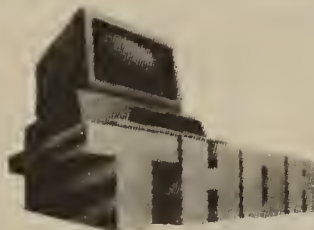
Salary will be commensurate with qualifications and experience. Clarkson offers an excellent benefits package and employees are able to enter Bachelor, Master and Doctoral degree programs. Send resume, salary requirement and three references by December 23, 1987, to Richard D. Valente, Director, Educational Resources Center, Clarkson University, Potsdam, New York. 13676.

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Sr. DBA Analyst/DBA Analyst/Assoc. DBA Analyst

You will perform data analysis, modeling and normalization activities, develop logical and physical data structures, develop data base related standards and procedures; supervise test and production data base maintenance and support activities; design and install IMS data bases for large scale IBM systems; provide for data base performance analysis and tuning activities. These positions require 1-7 years data processing experience including 1-3 years recent background as a Data Base Analyst or Administrator in an IMS DB/DC environment and 2-4 years in IMS DB/DC applications analysis and programming. (Job Code JG-1)

DATA SECURITY

Sr. Data Protection Analyst

A career in the rapidly growing field of computer systems security. Take part in designing protection for an IMS network running 6 million transactions a day and developing security procedures for an increasingly large number of microprocessors. Your background should include 5 years data processing experience including 3 years in Systems Development, 2 years computer security experience, Bachelor's degree or equivalent work experience. Knowledge of ACF2 or RACF preferred. COBOL and IMS knowledge preferred. (Job Code JG-2)

IMS SYSTEMS PROGRAMMER

You will maintain and troubleshoot the latest IMS/Fastpath systems software and work with state-of-the-art technology. You must have 3 years recent work experience in data processing including one year experience in IMS systems programming. Excellent Assembler programming skills, ability to use systems dumps in problem determination and knowledge of IBM hardware and diagnostic techniques are a must. (Job Code JG-3)

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Senior Programmer/Analysts

Requires at least 1 year experience coding BAL in ACP or TPF environment and technical leadership with large systems in an on-line environment. Knowledge of IBM Assembly language, CMS and COBOL is desired.

Data Management Specialist

This position requires 5 years total EDP experience with at least 2 years in ACP systems programming or systems development. Familiarity with MVS, JCL, Utilities required. Must be able to work in a high pressure, technical environment with occasional irregular hours.

If our opportunities seem intriguing, we'd like to hear from you. We offer excellent professional growth opportunities, a competitive salary/benefit package, which includes a 401K investment option, and shift pay differential. Please submit resume to: **AMERICAN EXPRESS, Attn: Pat Taylor, P.O. Box 53781, Phoenix, AZ 85072-3781.**

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Clarkson University is seeking an individual to serve as a consultant in the Academic Computing Services group of the Educational Resources Center. An Academic Computing Consultant supports faculty and student use of a number of networked host computing systems, workstations, and microcomputers in the UNIX, VAX/VMS, and VM/CMS operating environments. Specifically, the Consultant assists faculty and students in their use of these facilities through personal consultation, development and presentation of short courses and seminars, preparation of printed and online documentation, and assistance with acquisition, installation and maintenance of academic software packages.

The applicant must demonstrate excellent verbal and written communication skills. A B.S. degree in a field of Science or Engineering is required; an M.S. degree is preferred. A special facility in the language of scientific discourses is needed. Also required are two years experience in support activities in a highly diversified university computing environment.

Salary will be commensurate with qualifications and experience. Clarkson offers an excellent benefits package and employees are able to enter Bachelor, Master and Doctoral degree programs. Send resume, salary requirement and three references by Dec. 23, 1987, to Robert C. Barringer, Assistant Director, Educational Resources Center, Clarkson University, Potsdam, NY 13676. An Equal Opportunity/Affirmative Action Employer.

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Tactics vary in hiring

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Wisconsin, which provides automated banking services for 185 client banks in a four-state area. "You cannot go out and buy the kind of loyalty and responsibility you get promoting from within."

Spillane himself joined First Wisconsin while he was a student at Marquette University in Milwaukee and worked in the bank's data processing and communications departments before assuming his current position in 1986.

While First Wisconsin's approach has been to staff most of its 40-person communications group from within the corporate ranks, other companies employ different tactics to handle the vital job of hiring. In fact, hiring tactics often reflect the user's corporate culture.

But one thing is clear. There is a dearth of qualified communications personnel, and users must develop an effective strategy for building a topflight staff to use communications to a competitive advantage.

Spillane said he believes one of the keys to the success of First Wisconsin's promote-from-within policy is the bank's extensive training program. He estimates that communications staff members received some 1,000 hours of training in 1987. This training came from a variety of sources, including vendors and the bank's own in-house training unit. All communications staffers, for example, must undergo the initial training program required for bank tellers.

"I've never thought of our train-

ing budget as an expenditure, I see it as an investment that has paid off marvelously," said Ron Jaeger, assistant vice-president of Data Network Services at First Wisconsin and the man to whom Spillane reports.

"For example, we sent people off to training conducted by Paradyne [Corp.] in Largo, Fla.," Jaeger said. "They came back and were totally prepared when it came to working with our equipment and in dealing with Wisconsin Bell."

Jaeger declined to disclose the size of the bank's training budget, saying, "It's a wonderful budget, so good that I wouldn't want some of my colleagues to know the actual figure."

Miami-based Florida Power & Light Co. takes a different tack than First Wisconsin Bank. Over the years, Florida Power & Light has developed a pipeline to local telecommunications vendors and other user organizations. That pipeline delivers a steady stream of experienced communications personnel, according to Everett Stonebreaker, telecommunications coordinator.

"Probably the best way to get good people is through word of mouth," Stonebreaker said. "We have an unwritten policy that we do not directly recruit from other companies. But, when we have an opening, the word gets out."

According to Stonebreaker, satisfied Florida Power & Light employees who have joined the utility from other companies are quick to inform their former colleagues when Florida Power & Light has an opening.

The opportunity for advance-

ment and the technical and management training programs offered by Florida Power & Light attract communications employees, Stonebreaker said.

Like First Wisconsin, Florida Power & Light also believes in the power of promoting from within. "Typically, we don't hire management and supervisory people from outside the organization," he said. "We like to provide the chance for people to come in and grow and advance in our organization."

As with many other users, Florida Power & Light beefed up its communications staff following divestiture. "We got behind the eight ball in terms of staff size vs. our work load from 1983 to 1986," Stonebreaker said.

From 1984 to 1986, Florida Power & Light doubled its communications staff to 32 people and will add three more staff members in 1988, according to Stonebreaker.

When Citicorp Savings of California, headquartered in Walnut Creek, Calif., set out to increase its communications staff, the company chose to recruit communications professionals directly from other user organizations and vendors. "I felt like a first round draft pick when the bank recruited me," said Roberto Gittens, a senior data communications analyst at the bank.

His colleague, Mark Carpenter, a senior telecommunications analyst who was lured to the bank from discount broker Charles Schwab & Co., Inc., expressed similar enthusiasm about his position with the bank.

While Florida Power & Light, First Wisconsin Bank and Citicorp

Savings of California are in different geographic areas and in different types of businesses, they share a common philosophy when it comes to communications.

The three organizations are aggressively implementing communications strategies designed to provide them with a competitive business edge. And, according to Norm Oppenheim, president of Fortune Communications Group, a recruiting firm in Nashua, N.H., this approach is as important as salary in attracting young communications staffers looking to work with the latest applications and technology.

First Wisconsin's Jaeger said the bank's personnel department includes two people with DP backgrounds who ensure that salaries for the technical staff are competitive with other companies in the area. Stonebreaker said Florida Power & Light also pays salaries that are competitive with other South Florida businesses. "We make sure our personnel department is aware of the high degree of experience and skill we require in our employees," he said.

Both men, however, attributed their companies' ability to attract and keep communications personnel to their organizations' stimulating work environments and the opportunity for continued professional training and advancement.

For their part, Gittens and Carpenter of Citicorp conceded that the chance to make more money was a factor in their joining the bank. But they said the opportunity to work in a first-rate communications organization was perhaps a more important lure. ▀

Service threatens private lines

continued from page 11

these digital services will be limited to major metropolitan regions that have digital central offices. Analog central office facilities will not be able to deploy digital switched services.

Bell Atlantic Corp., the only RBHC not currently offering the high-speed service, is now reviewing the possibility of doing so. "We see a market need for this type of service, and we are in the process of developing a business plan for such an offering," said company spokesman Larry Plumb.

The most prevalent applications for local digital switched 56K bit/sec service are private-line net backup and disaster recovery, said Robert Fulghum, staff manager for Digital Data Services at South Central Telephone Co., the local operating company of BellSouth.

Other potential applications include slow-scan video for teleconferencing and videoconferencing services; high-speed facsimile, computer-aided design and manufacturing transmissions; bulk file transfers; and electronic mail, said Michael DiLorenzo, director of Data Solutions Management at New York Telephone Co., a subsidiary of Nynex.

Most RBHCs have targeted large data users, but the service could

also be useful to smaller businesses. Customers in manufacturing, insurance, health care, financial and government sectors are target customers, DiLorenzo said.

"This service really spans all business sectors," said James Longua, manager of new product development at Ameritech Services, Inc. "We're looking at both vertical and horizontal businesses that have multipoint, low-traffic, bulk data applications," he said.

The cost of these services varies from state to state. Most RBHC offerings include a one-time installation fee, which ranges from \$150 in New York to \$700 in Ohio.

Recurring monthly charges include a flat service charge and a variable usage-sensitive charge. The monthly service charge is relatively consistent throughout RBHC regions, ranging from \$35 in Ohio to \$69 in Florida. Usage-sensitive rates range from 8 to 10 cents per minute in most regions.

The limited availability of digital switched service, combined with reluctance of users to give up private-line facilities for data applications, will make digital switched 56K bit/sec services a tough sell, despite the cost advantage over private lines, according to industry analysts.

For example, Pacific Bell currently offers digital 56K bit/sec dedicated service at a cost of \$548 per month, with no usage charge. This compares to its switched 56K bit/sec service, with a monthly charge of \$189, plus a usage-sensitive fee of 7 cents per minute. Switched 56K bit/sec service is cost-effective for up to about 86 hours of traffic per month, according to Robert Ellis, president of Rockville, Md.-based Aries Group, Inc. After that, dedicated private lines are more effective, he said.

According to Joaquin Gonzalez, vice-president of enterprise networking strategies at Gartner Group, Inc. in Stamford, Conn., "The RBHCs are going to have limited market response for these switched data services, simply because data applications have vastly different requirements than voice."

"The local telephone companies and AT&T approach data applications and data services as though they are the same as voice services, and that's a big mistake," Gonzalez said.

Data communications managers want network diagnostics, bandwidth management capabilities and dedicated connections for their precious data traffic, Gonzalez said. Those capabilities aren't available with switched services, he said.

Large data networks traditionally use dedicated transmission facilities, Ellis said. IBM, for example, encourages its large data customers to operate in the dedicated environment. IBM equipment has a lot of trouble in the switched environment, Ellis said, adding that IBM's communications architecture is geared to dedicated facilities.

Deployment of digital switched 56K bit/sec service will require customers to upgrade their in-house communications systems in order to transmit data at 56K bit/sec, Ellis said. Many users are now transmitting at slower speeds, and the transition to 56K bit/sec is going to be a slow process, he said.

For example, credit card verification services currently operate at a universal 1,100 bit/sec speed for dial-up applications. If those transactions were to occur over switched 56K bit/sec services, all the point-of-sale and transaction processing nets around the world would have to adopt different standards and change communications architectures, Ellis said.

Utilization of digital switched 56K bit/sec will require users to purchase some fairly expensive customer premises equipment as well. Data service units/channel service units (DSU/CSU) cost between \$800 and \$1,000, and each 56K bit/sec line would require a dedicated DSU/CSU. ▀

IBM eyes PacTel Spectrum

continued from page 1

ment package, according to industry analysts.

PacTel Spectrum, a company owned by regional Bell holding company Pacific Telesis Group, offers customers a service that stores configuration information in a data base, monitors a customer network, identifies network problems, notifies the appropriate vendor when equipment is not functioning properly and provides custom reports.

A spokesman for PacTel Spectrum said employees were told the company plans to announce a deal with IBM soon but that they were not given any details about the pact. An IBM spokesman refused to comment on the possible alliance.

Realizing that network management is a key to keeping customers in its camp, IBM has been busily enhancing NetView, its host-based network management system, to meet the needs of large customers. However, the company has done little to help mid-range customers manage their networks.

"In the mid-range, DEC is beating IBM up, and one reason is DEC's superior network management products," said Thomas McDonald, principal consultant at MGT Technology Group, a consulting firm in Natick, Mass. "Mid-range machines like the System/36 and System/38 lack network management procedures, functions and capabilities," he said.

PacTel Spectrum is geared to these types of customers, companies with small MIS staffs and networks supporting strategic applications. PacTel Spectrum places diagnostic equipment, which monitors all network products and con-

nections, at a customer's site.

The diagnostic equipment transmits performance information to one of 20 PacTel Spectrum service centers across the country. After identifying a network problem, a PacTel Spectrum network operator accesses a data base with information concerning the customer's network.

The data base contains information about each piece of equipment, including the name of the person responsible for handling a problem. The network operator then notifies the vendor and the customer of the problem.

PacTel Spectrum has been marketing the service for two years,

"In the mid-range, DEC is beating IBM up, and one reason is DEC's superior network management products," said Thomas McDonald of MGT Technology Group.

and customers said they are satisfied with it ("Users give PacTel Spectrum high marks for net services," NW, June 1). However, the service has been deemed expensive by users, and the company has not met revenue projections, according to industry analysts. "I'm skeptical of long-term success of network management services providers," said Katherine Korostoff, an analyst at International Data Corp., a Framingham, Mass., market research firm.

"Users have become attached to the idea of managing their own networks and spent a lot of money to gain control of them. Why should they turn them over to third-party service vendor?" she said.

Last summer, Spectrum laid off 30 employees and reorganized its product line ("PacTel Spectrum resculpts strategy," NW, Aug. 10). At that time, the company began looking for a suitable partner or a possible buyer, analysts said.

The company approached IBM, which was looking for business partners. IBM's Communication Products Division has a full plate of major projects, such as transforming Systems Network Architecture from a hierarchical networking scheme to a peer-to-peer architecture, and understands it does not have the resources needed to develop all the products and services customers require.

When PacTel Spectrum came calling, IBM was formulating a plan to beef up its mid-range network management offerings. PacTel Spectrum also had a project under way to link its service more tightly to NetView. The two companies decided to pool their resources.

Analysts said they were not sure how well the alliance would work. IDC's Korostoff noted that IBM's network management strategy is based on NetView. The company plans to enhance the product as well as develop versions of the package that run on smaller systems, like the System/36, System/38 and Personal System/2. The alliance may be a stopgap measure until the other projects are completed.

Gerald Mayfield, vice-president at the DMW Group, Inc. of Stamford, Conn., noted that the PacTel Spectrum service is based on DEC equipment. He said IBM's marketing focus is aimed at Fortune 500 accounts and that the company has little interest selling equipment to smaller companies, PacTel Spectrum's typical customers. □

CALENDAR

Dec. 14-16, Washington, D.C. — The New Standards: OSI and ISDN. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Dec. 14-16, Los Angeles — Hands-on SNA. A Complete Examination of IBM Protocols. Also, Jan. 6-8, Baltimore; Jan. 13-15, Sacramento. Contact: Datacomm Group, American Institute, Inc., 55 Main St., Madison, N.J. 07940.

Dec. 14-18, Washington, D.C. — Introduction to Digital Telephony. Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

Jan. 11-15, Irvine, Calif. — ISDN Week. Contact: Teledimensions Systems Corp., 21552 Shillingsburg Ave., San Jose, Calif. 95120.

Jan. 14-15, Seattle — Networking the IBM PC, XT and Compatibles. Contact: Data Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

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► *PRODUCT COMPARISON*

A certain synchronicity

Autodial modems from Racal-Vadic and UDS push ease of use and low pricing.

BY JOHN J. HUNTER

Contributing Editor

Users of synchronous autodial modems have long complained about high prices and clumsy dialing procedures. Recent products from Racal-Vadic, Inc. and Universal Data Systems, Inc. (UDS) try to silence such complaints.

The Racal-Vadic 9650PA and the UDS 9600B run at 9.6K bit/sec half-duplex over leased two-wire or conventional telephone lines and support first-class synchronous autodialing protocols and procedures that are as easy to use as some asynchronous dial protocols.

The Racal-Vadic protocol is Synchronous Auto Dial Language (SADL); UDS calls theirs Sync-Up. Users familiar with the more popular asynchronous modem communications packages such as Hayes Microcomputer Products, Inc.'s Smartcom will feel at home with SADL and Sync-Up.

The 9650PA is a stand-alone unit, while the 9600B is a printed circuit plug-in card that works with an IBM Personal Computer, XT, AT or Personal System/2 Model 30 Personal Computer.

It may seem odd to contrast two different types of modems. But since they perform essentially the same function, it's interesting to see how the two approaches compare.

Characteristics

Both modems are CCITT V.29-compatible. The 9650PA, however, also supports CCITT V.27ter, which allows it to operate in fallback mode at 4.8K and 2,400 bit/sec. The UDS 9600B runs at 9.6K bit/sec only.

Since the public telephone network provides inconsistent quality for data transmission, modems running at 9.6K bit/sec frequently suffer from a high incidence of data errors. Therefore, fallback speeds are an advantage. While lower speeds also cut throughput, they eliminate errors and reduce the number of retransmissions if the modem or the transmission protocol handles error correction.

Both units also support Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control. Since these protocols transmit data in blocks, it's more efficient to reduce the chance of errors occurring during transmission — as should be the case when using lower, fallback transmission rates — rather than retransmitting large data blocks.

Since both modems operate at half-duplex, training time, Clear to

Send delay, is important. The 9650PA, at 25 milliseconds, has one of the shortest delay times in the industry; the 9600B follows closely at 30 milliseconds. In addition, the UDS modem can be set for 50- or 150-millisecond delays.

The two modems are also software-programmable. The 9650PA's configuration parameters can be set with a 12-key keypad on the unit's front panel, or data transmission equipment can be used. With the keypad, an LCD display screen on the modem prompts the user. Since the UDS 9600B is a plug-in card, it's programmable only through the personal computer in which it's installed.

Operational design

There are pros and cons to stand-alone vs. plug-in design schemes. As a stand-alone unit, Racal-Vadic's 9650PA isn't restricted to personal computer use, as the UDS 9600B is.

The unit also has an integral automatic dialer that supports the AT&T 801-type parallel Automatic

the 9650PA. Both must be purchased from other vendors. This could cause operational and maintenance responsibility problems, since the products aren't designed as integrated units.

Emulation software

Both the 9650PA and the 9600B require emulation software to link them logically with a personal computer. While they come with IBM SDLC and BSC protocol handling built-in — via SADL and Sync-Up, respectively — users must furnish their own emulation software in order to communicate with IBM hosts. UDS sells such products, but Racal-Vadic does not.

There are many hardware and software products that emulate systems like IBM's 3270 3X74 cluster controllers, 3X7X workstations, and the 5251, 3770 and 2780/3780 ("Protocol converters feel peer pressure," *NW*, May 11). It's smart to buy a combined system instead of using separate components, since the former are designed to work together without

protocols in native mode.

The complete SADL protocol suite is built into the 9650PA modem and receives its dialing commands from the associated DTE. To use SADL with a personal computer, a third-party autodialer is needed to interact with the emulator product and communications protocol software.

Racal-Vadic does not offer a dialer, but dialers can be purchased from companies such as AST Research, Inc., Irvine, Calif., and Pathway Design, Inc., Wellesley, Mass. The Cleo Software division of Phone 1, Inc., Rockford, Ill., offers SADL-compatible products that have dialers built into emulator cards. Cleo's PC2-3276/2 SHM and PC2-3276/12 SHM are for BSC and SNA/SDLC respectively and are priced at \$795 each.

If the Sync-Up user employs other than UDS-furnished emulation hardware and/or software, a separate dialer also will be required. UDS sells such products for \$60 each.

Summing up

The 9650PA is the more flexible product of the two modems, giving users the option of employing it with minicomputers, mainframes and personal computers. Its built-in 801 autodialer obviates the need for an external unit, and the modem supports serial dialing through SADL.

The 9650PA also offers a wider range of operating speeds, and its 25-millisecond training time should guarantee high performance. The fact that Racal-Vadic does not offer emulation facilities could be a drawback, since users must shop for products that are compatible with both the modem and SADL if SADL is used. UDS, incidentally, makes a product similar to the 9650PA. Called the UDS 9600 A/B, it's not software-programmable and has no built-in 801 or serial autodialer.

The UDS 9600B is less flexible and runs only at 9.6K bit/sec. It is, however, sold as an integrated unit; its Sync-Up protocol looks to be first class and its training time is close to the Racal-Vadic product. The 9600B is also less expensive, both for the base unit and emulation software, but Racal-Vadic is considering a card version of the 9650PA. □

Two high-speed modems compared

	Vendor/Product	
	Racal-Vadic, Inc. Milpitas, Calif./ 9650PA	Universal Data Systems, Inc. Huntsville, Ala./ 9600B
Packaging	Stand-alone	Personal Computer card
Emulation hardware/software	Optional	Optional
Cost	\$1,695	\$1,540

SOURCE: TMS CORP., DEVON, PA.

Calling Unit (ACU), or can be used for serial dialing. The 801 ACU is frequently used at host computer sites and controls racks of modems making outgoing calls.

By contrast, the UDS modem doesn't support ACUs. Its data transmission is strictly serial, and it uses the personal computer's RS-232-C serial port to send commands and data to the modem; the ACU uses a separate path.

The Racal-Vadic 9650PA also supports serial processing and uses its RS-232-C interface for control and data transmission. To support serial dialing with the 9650PA, the transmitting device requires an optional autodialer.

The stand-alone packaging of the 9650PA does extract a penalty when the modem is used with a personal computer. The standard communications ports on a personal computer are asynchronous and therefore require a synchronous data converter, generally in the form of a plug-in card.

In addition, a software driver must be used to interface between the personal computer and the data converter. Racal-Vadic offers neither a synchronous data converter nor a software driver for

modifications. Unfortunately, that's not always the case when separate components are used.

The UDS 9600B modem is designed specifically for personal computer use and so has a synchronous data converter and software driver built in. Also, UDS offers BSC and SNA/SDLC product emulators. IBM 3270, 3770, 5251 and 2780/3780 BSC emulators are \$325, while SDLC costs \$525.

SADL and Sync-Up

UDS and Racal-Vadic modems incorporate their own serial autodial protocol software. UDS uses Sync-Up; and Racal-Vadic employs SADL. Both protocols are modeled after the CCITT V.25bis autodial protocol but offer proprietary enhancements that restrict their use to like products. Therefore, SADL and Sync-Up can't communicate with modems using V.25bis.

The Sync-Up dialing protocol is based on IBM's BSC, but it can be used for SNA/SDLC. Dialing with Sync-Up is initiated in Sync-Up/BSC, but once the connection is made, UDS-supplied software transfers data in SNA/SDLC format. SADL is more flexible, supporting BSC, SNA/SDLC and HDLC

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Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

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